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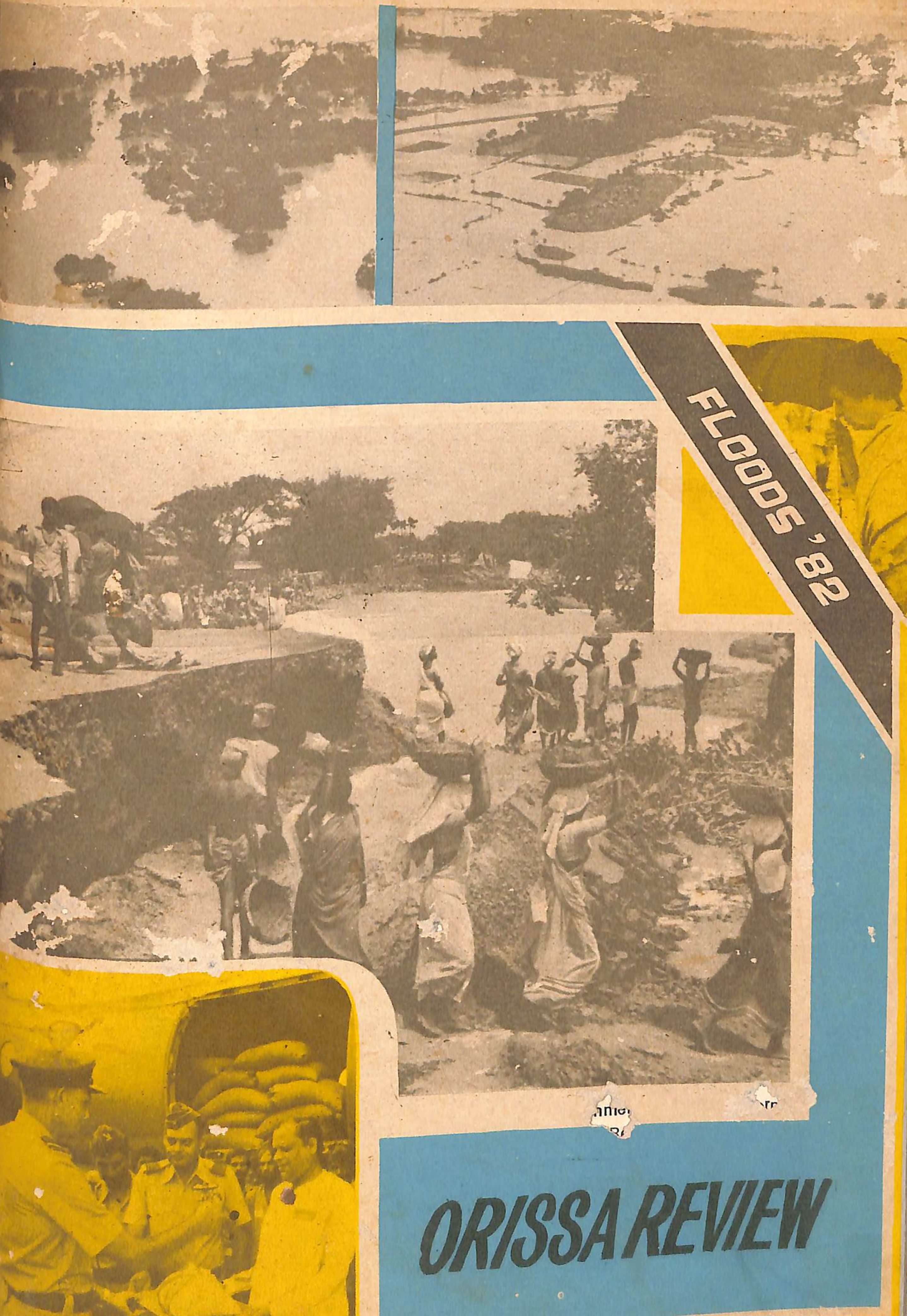
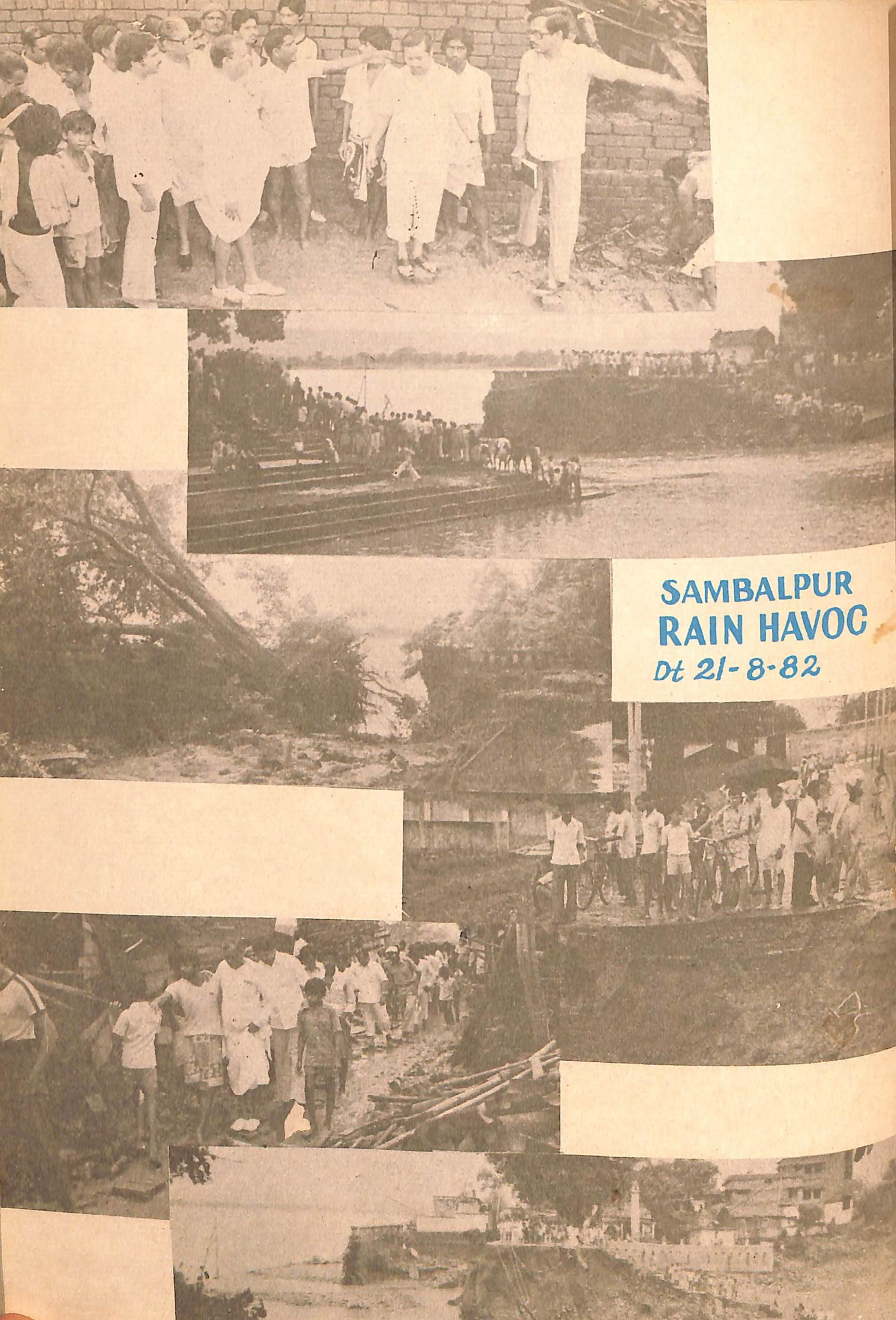


FLOODS '82

ORISSA REVIEW



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Natural Calamity due to ecological imbalance

Shri Basanta Kumar Biswal
Minister of State
Works, Housing & Urban Development
and Mining & Geology, Orissa

Ecology is one of the most important of the science, if you consider, the long term human survival. Man is a part of his environment and not apart from it. But as yet, this important science is not much understood by the general public. It is however, heartening to note that this has already become an elite subject in your country and in course of time, the knowledge may spread and contribute to better management of the environment.

A very interesting feature comes out from the laws of ecology. It is said, everything is related to everything else. Man claims to be superior to everything around him and commands them to his advantage. But, for his own food, he depends upon photosynthesis. The large Oak in the forest depends upon the microscopic organisms which break down the fallen leaves so that nutrients are released for the Oak roots to absorb. Interdependence may be in a very complicated way. It may not be apparent. Nevertheless, the area of interdependence may be very crucially significant. Therefore, it will be unwise for man to discard species or interfere in the nature as of no consequence.

It is a comforting phenomenon that nature adminsters a law of limitation. The highest tree also stops growing beyond a height. No tree can grow indefinitely. No organism or species can multiply indefinitely also. The animals instinctively limit their number so that they do not run out of their much needed resources in the ecosystem.

Nature obeys its own rules and not ours. But man boasts of conquest of nature so much so that man's progress has become almost synonymous with assault on nature. When in 1953 the highest mountain peak was climbed it was called conquest of Mount Everest. Jawaharlal Nehru objected to the phrase 'Conquest of Everest'. He considered. it was arrogant to term the event in that manner. Man is only one of the many species who inhabit the earth. But Man exploits nature regardless of the laws of nature and the interest of other species. Man's intervention has been increasingly extensive. It has caused even more disruptive changes which have potentially serious impact on man's existence. In ecosystems it may be often difficult to correlate causes and effects. Those may be widely separated in terms of both time and space. Man's intervention therefore may lead to unexpected consequence sooner or later. As one study puts it because of spraying pesticides to kill insects over a number of years bald eagle became extinct in the country which had made it a national symbol. Through food chains pesticide got concentrated and accumulated in the tissues of the eagle and also in certain other birds, whose reproduction was impaired,

Another study revealed that, among the world's rarest birds Bermuda Potrel is one with a population of only about 100. Significant levels of D. D. T. were detected in these birds. D. D. T. must have come through oceanic food chain-coming to ocean from mainland 650 miles away. it was apprehended reproduction of this rare bird might completely stop at some stage. it must be realised that an environment in which animals and plant become extinct is not safe for human beings either. Natural calamities are annual visitors in our State. Those are manifestations of wrath of nature. Scientifically you may trace their origin to ecological imbalances in creation of which man himself was instrumental by extensive felling of forest, interfering with water system and the life.

Pollution is an aspect of the environment which is causing increasing concern to us. Prevailing natural conditions, human population, levels of production and consumption and the level and use of technology all are factors which will indicate the level of pollution in affluent societies, pollution may be the effect of the use of technology. In poverty ridden societies, problems of enviroment are caused due to unsafe drinking water, malnutrition, poor sanitation, inadequate housing and disease. Considering this aspect, an international group of economists pointed out that development measures may not be viewed as a cause of ecological problems but a cure of it. In developing countries like ours, the lot of the poverty ridden society can be improved through planned development. It is at the stage of planning that care must be taken to ensure that there should be qualitative improvement of life as a whole rather than quantitative growth of various sectors of economy. Our attention cannot be diverted from the main objective which is to raise a vast mass of people from conditions of poverty to a happier State. It is not as if we have to chooce between poverty and ecological imbalance or environmental pollution. Through process of planning potential source of creating ecological imbalances could be eliminated where damage has already been done, restorative measures should be carefully planned and sincerely implemented before it is too late.

By its definition—Environment is pervasive. Environmental Planning towards any objective cannot be fully achieved merely if official agency becomes environment conscious. There should be an educating process touching every level of worker-architect, engineer, contractor, technician, farmer, horticulturist and in fact, all citizens. The entire population has to be conscious of the need for environmental planning.

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DISASTER PREPAREDNESS— ROLE OF HEALTH ORGANISATION

Shri Harihar Karan
Minister of State,
Health & Family Welfare, Orissa

Natural calamities like flood, cyclone tornado and tidal inundations are not uncommon in our country. They visit us at different times during the year and take a heavy toll of life and property. With its long coastal belt, a large number of rivers fed by innumerable tributaries, our country is prone to destructive natural visitations.

The primary objective of relief in the past was to save life. No effort was spared to save the population from starvation, extremety of suffering or danger to life all the while ensuring that there was no tendency towards indiscriminate charity. It was primarily a rescue operation. At present, the primary objective is not only to ensure that no one dies of starvation but also to prevent physical deterioration in living standard and destitution of people. Assistance has to be provided to enable them to resume their normal or ordinary pursuits of life on return of better times and simultaneously to encourage the village community to make concerted efforts to fight the common misfortune. Modern approach to relief combines an element of the preventive, the curative and the rehabilitative. Unlike in the past the responsibility for relief now squarely rests on the State and extends not only to more prevention of drought or flood but also maintenance of a certain standard of economic health of the people.

In every natural calamity, Medical and Public Health Organisations are called upon to play a prominent role. In times of severe distress, the mortality may be high not only as a direct result of the calamity but mostly as a result of increased incidence of diseases, reduction of vitality and consequential fall in resistance to disease. All these factors may contribute to an outbreak of epidemic like cholera, typhoid or other gastro-intestinal disorders. We should, therefore, always aim to strengthen the medical and Public Health arrangements in advance so that adequate measures are put on the ground to prevent outbreak of epidemics as well as to treat the affected people with utmost expedition. This calls for disaster preparedness in form of advance planning for additional medical and paramedical manpower, stock piling of essential medicines, disinfectants, vaccine including anti-snake venom at nodal places, advance action for transportation of sick persons, alternate accommodation for medical centres, emergency hospital services and co-ordination with voluntary organisations. Emergency medical care including supply of safe and drinking water, immunisation of affected population against cholera and typhoid, anti-fly and anti-mosquito measures would also necessary during evacuation and also in marooned villages and evacuee camps.

Geographical location of Orissa, which in every respect is a meeting place of different cultures and climates has made it more prone to natural disasters than any other State. While other States like U. P, Bihar, West Bengal and Andhra Pradesh are victims mostly of flood, we in Orissa have to face flood as often as cyclone, tornado and tidal innudations. At times, these calamities visit us at short intervals. This year, the people of Orissa have had the misfortune of experiencing at an interval of hardly two months both cyclone and flood, which in their intensity exceeded all previous records. The devastating cyclone of 3rd June paralysed the normal life in the coastal Orissa and adjoining districts and claiming 2,461 human lives as its victims leave alone a large number of cattle. The wind speed recorded at Paradeep was 220 Kms. per hour. An idea of the destructive funs can be gained from the fact that a coal vessle tore off its moorings and rammed one hundred-ton barge laden with CARE cargo and two boats. Many small craft anchored in the turning circle sank. Hardly had two months passed when Sambalpur was delused. Many were rendered homeless and almost destitute. It was the vigour and speed of public health measures which prevented an outbreak of epidemic.

Unprecedented flood in the basin of Mahanadi during August-September has brought in its wake colossal devastation in 105 Blocks spread over 8 districts of the State. Nearly 10 million people in as many as 1,400 Grama Panchayats have been affected, 5·2 million very severely indeed. Normalcy has not fully returned. Flood water is yet to recede. Several showers of rain pouring almost every day since the day of flood has aggravated the condition of the affected people further. Intensive medical and public health measures are continuing in full swing to protect the flood stricen people in the affected areas from health hazards. Arrangement have been made to provide anti-epidemic, medical and public health measures not only to 52 lakhs people, who are seriously at risk and most of whom are even in normal times hyper-endemic to gastro-intestinal diseases but also to build up a protective zone to prevent the spread of infection. Our strategy includes anti-cholera innoculation and repeated chlorination not only in hyper-endemic areas but areas close by also. Salient features of the strategy include organisation of medical relief teams consisting of one Doctor, 4 para-medical workers and 5 Village Health Guides for every 10,000 people or 2 Grama Panchayats. Number of Grama Panchayats being nearly 1,400, 700 such teams have been organised. 100 teams have been kept in reserve to be rushed, should the necessity arise, to areas needing immediate medical relief and preventive health measures. A successful campaign against health hazards will call for mobilizing 800 Doctors, 3,200 pera-medicals and 4,000 Village Health Guides. Since sufficient number of Doctors and para-medicals were not available in the affected areas, house surgeons/P.-G. students from medical colleges and other staff from non-affected districts have been pressed into service.

In spite of the inaccessibility of the affected area, medical teams have rushed to the interior during the 1st fortnight and completed innoculation of nearly 9 lakh people, chlorinated 100,000 water sources and treated 4 lakh people of common ailments. Senior Medical Officers have been stationed at strategic places to supervise the health measures.

Our experience of administering the programme of medical relief and public health over the years has shown that we cannot wait for the normalcy to return before instituting anti-epidemic measures and that complete preparedness to handle any emergency must always be maintained. Such a preparedness is not possible unless reliable logistics, camp-equipments for field and mobile hospitals and utmost mobility are provided. The idea is to build up a self-contained mobile team capable of moving any where under any circumstances to set up facilities for immediate anti-epidemic services. We are proposing to have a fleet of six power boats which will serve as floating hospitals, 4 vehicles, pre-fabricated tents, if possible, otherwise Swiss Cottage Tents for setting up of camp hospitals. Such self-contained medical relief teams can take up measures of primary health care in the riverine and coastal belt of Orissa even in normal times and can prove of inestimable value when the State is stricken by any of the recurrent natural disaster.

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Heavy Rainfall and Flood in Orissa

(August-September, 1982)

G. Arunachalam

आदित्यात्जायते वृष्टिः वृष्ट्येरन्नम् ततः प्रजाः

But on the intervening night of the 18th and 19th August 1982, it rained so heavily over Sambalpur and adjoining Burla and Hirakud, that it appeared as though it will never stop and there is grave danger for both grain and the people. By early morning, the whole area was a vast sheet of water, in some places 4 to 5 feet deep. When the rain recording observer went to measure the rainfall. he found that the raingauge has overflown indicating that the amount of rainfall was more than what the generously proportioned raingauge can hold. Even then he measured a staggering 582 mm. of rainfall. Since the raingauge has overflown, the actual rainfall would have been more than 582 mm. The previous night's rainstorm had broken all previous records of a single days rainfall at any place in Orissa during the last 100 years for which records are available.

Yet this was not the only new record that has been created during the fateful month of August 1982. Barely 10 days later on the 28th, 29th and 30th August the weather went wild over a vast area in the districts of Balangir and Phulbani and the adjacent areas of Dhenkanal, Sambalpur and Kalahandi districts. The heavy and incessant rainfall that occourred ever these areas on these three days sent down Mahanadi river the highest ever flood in a century despite the fact the rainfall over a vast catchment area upstream of Hirakud Dam was effectively prevented from contributing to the flood lower down.

How and when are such phenomenally heavy rainfalls produced? Can they be predicted? What can be done to control the floods that these exceptionally heavy rainfalls produce?

The south-west monsoon brings the life sustaining rains to Orissa as it does to all the other parts of our country. June to October are the monsoon months. After the south-west monsoon withdraws, the post monsoon depressions and cyclones bring some more rains to Orissa till about the middle of December. Thereafter the rainfall over the State is associated with the winter and summer thunderstorms. However, the period of heaviest rainfall over any part of Orissa is the south-west monsoon season from June to October.

During the monsoon months, a series of low pressure systems develop over the northern parts of Bay of Bengal and move towards Orissa coast. It is these low pressure systems, which develop on a number of occassions into depressions and rarely also into a cyclonic storm, which cause the exceptionally heavy rainfall over Orissa. A few of the most important factors which determine whether heavy and exceptionally heavy rainfall will occur with any of of these low pressure systems are—

(1) Moisture content of the atmosphere and its continued movement into the specified area.

(2) The contiguration of winds at different levels of the atmosphere over the country north of 15°N from ground level to about 15 Km. above sea level.

(3) The direction and speed of movement of the system and also the changes that often occur in the direction of movement and speed of the system and so on. With this background, let us examine the two spells of stunning rainfalls in Orissa during August 1982.

The first system : August 17th to 20th

A low pressure area developed over North Bay of Bengal on 17th and this intensified into a depression by 18th morning. At 8·30 A.M. on 18th, it lay centred about 175 Km. East, south-east of Balasore. This system moved west-north westwards and crossed North Orissa coast near Balasore on 18th night. By 19th morning, the system weakened into a low pressure area and lay over north interior Orissa. Thereafter it moved away northwards. The track of the system is shown in Fig. I.

Heavy rainfall occurred over several areas of North Orissa in association with this system. But the most noteworthy feature is the phenolmenally heavy rainfall in Sambalpur and its immediate surroundings and the very haavy rainfalls in Sambalpur district and the adjoining areas. This led to the first wave of minor floods in Mahanadi on the 20th and 21st August 1982. The actual distribution of rainfall as measured on 19 th morning is shown in Fig. 2.

The second system : August 26th to September 2.

The low pressure system, that actually wrought havoc in 8 districts of Orissa was first observed as a low pressure area over central parts of Bay of Bengal and adjoining North Bay on 26th August morning. By 27th morning this has intensified into a depression located about 270 Km. south-east of Chandbali. This depression moved northwestwards and by that evening, it was located about 130 Km. South south-east of Chandbali. Then it moved North-northwestwards and by 20th morning, it lay close to Orissa coast near Chandbali. Thereafter, however, its movement was erratic and unusual. Till the evening of 28th, this depression moved northwards and crossing the coast north of Balasore by midnight on 28th, the system intensified into a deep depression and started moving west-south westwards, on 29th. By 29th morning, it was to the east of Keonjhar and by the evening, it had moved very slowly to about 50 Km. south of Keonjhar. By the night of 29th, however, this depression changed course again, recurved, shifted northwards and by 30th morning, it lay about 50 Km. south-west of Chaibasa. Thereafter it moved away north westwards.

The heaviest rainfalls associated with this system have occurred during 28th, 29th and early morning hours of 30th when this depression was showing eccentric movement. The most intense rainfalls have occurred over Pnulbani and Balangir districts towards which the depression was heading on 28th night and 29th morning. The accumulated rainfall distribution for 28th, 29th and 30th August 1982 is shown in Fig. 3.

What were the reasons for the abnormally heavy rains on 18th-19th and 28th, 29th and 30th ? Taking first the earlier case of 18-19th August 1982, the following features are observed—

(1) The wind distribution in the lower levels of atmosphere were such that the atmosphere was surcharged with lot of moisture.

(2) The upper wind contiguration was favourable for heavy rains to occur over North Orissa; and

(3) The depression in the Bay of Bengal also moved sufficiently slowly to maintain the heavy rainfall producing conditions over North Orissa for sufficiently long time as to actually cause the heavy rains.

But what about the 582 mm of rainfall ? Can it be predicted and has it been forecast ?

From the accounts of the actual occurrence, it was a cloud burst. It is reported that the bulk of this rain occured between 9·0 p.m. on 18th and 2·0 a.m. on 19th. An examination of the rainfall record of Hirakud indicated that 28 cm. out of 40 cm. of rain had fallen during the four hours period between midnight and 4·0 a.m. on 19th. Exceptionally heavy rainfall has occurred over a small area of 300 Sq. Km. or less. Whereas over a much larger area rainfall amounts of 20 cm. or less rainfall has been recorded. With the present development of our knowledge of wether science and with the available infrastructure and facilities at our disposal, it is not possible to forecast and pinpoint quantitatively such extraordinarily heavy rains. It is rather unfortunate that this heavy rainifall should have occurred over a thickly populated town and its environs where extensive irrigation systems and power generating station is located so that it has caused misery and damage on a large scale. Had this rainfall occurred over a sparsely populated tract, it would have practically gone unrecorded.

Now taking the second case that of 28th to 30th August 1982 the following features are seen—

(1) The wind flow over the lower levels of atmosphere was such the atmosphere over South Orissa and adjoining areas was loaded with moisture.

(2) The upper wind contiguration was such as to encourage large scale upward motion of warm air supercharged with moisture which resulted in copious rainfall over an extensive area.

(3) The unusual movement of the depression west southwards from 28th night to 29th night and its slowing down before ultimately recurving made the heavy rainfall continue over the same area for more than two days, thus making a severe flood inevitable.

This system was expected to cause very heavy rains over Orissa. It could not be prevented. The intensity of rainfall associated with this system over a period of 3 days is unprecedented. Actually as per rough calculations, quantity of roughly 18,000 million cubic meters of water had fallen from the clouds as rain during those three days. It is only fortutious that on 29th night, this system suddenly recurved and moved rapidly northwards. But for this another mystery of nature, Orissa would have been plunged in to a catastrophy.

As the vast affected population is painfully recovering from the severe shock, the one question that is uppermost in everybody's mind is "Whether a situation of this type is likely to recur ?" And the available information indicates that the answer is a definite 'Yes' unless we take steps to meet the future challenge right now. So let us take a close look at all the available informations.

During the last eighty years for which well maintained records are available, there are two other clear cases in June 1925 and in June 1936, when exceptionally heavy rainfalls have occurred over the same areas of Mahanadi catchment, namely, Balangir, Phulbani districts and adjacent areas and caused floods in Mahanadi. The 1936 rainstorm is almost identical to the present one but it had lasted five days as against the 3 days in the present case. Apart from these, there are also about half a dozen severe rainstorms of more than 3days duration which had caused very heavy rains on both Mahanadi catchment upstream of Hirakud Dam and down stream of the dam. This establishes the need to control river Tel independently and also having further control of Mahanadi downstream of Hirakud.

Nature has endowed Orissa with plentiful of life sustaining rains. The year to year variability of rainfall over the State is small, but there are certainly some periods of very heavy rains. In the foreseeable future, fresh watar is going to be a very precious commodity. Therefore, it behoves us to pay urgent attention towards water resources development and management. Let us not wish for the end of heavy rains, but by properly harnessing the rivers concerned, let us try and turn a burdensome liability into a very valuable asset.

Director
Meteorological Centre, Bhubaneswar

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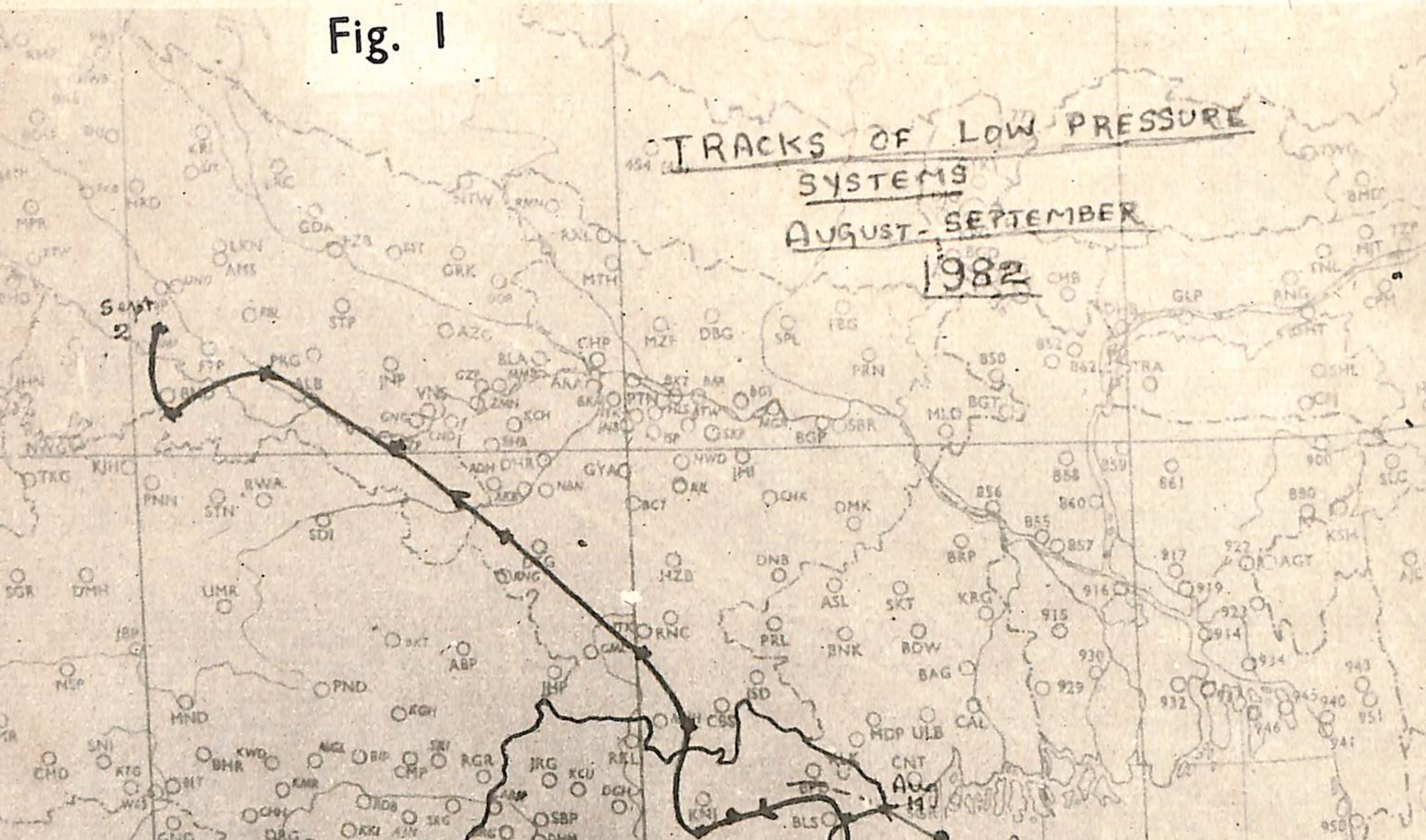
Fig. 1


TRACKS OF LOW PRESSURE SYSTEMS AUGUST - SEPTEMBER 1982
Sept 2
Aug 19
Aug 18
Aug 27
ORISSA
LEGEND
DEPRESSION 18th - 19th August
Depression 27th Aug to
PTN
GYA
RNC
JSD
CAL
BLS
CBL
CTK
PRD
BWN
GPL
KLN
VSK
SDH
BGP
SBR
BKR
MLD
DMK
ASL
BNK
BDW
BAG
CNT
KRG
BRP
SKT
JRG
SBP
ANG
TTG
KRP
JGD
PTG
BLR
NWP
RPR
DRG
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CTP
NDV
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MPT
ONG
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MND
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PNN
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CHP
MZF
DBG
SPL
PRN
JNP
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PRG
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LKN
GDA
GRK
STP
AZG
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Fig. 2

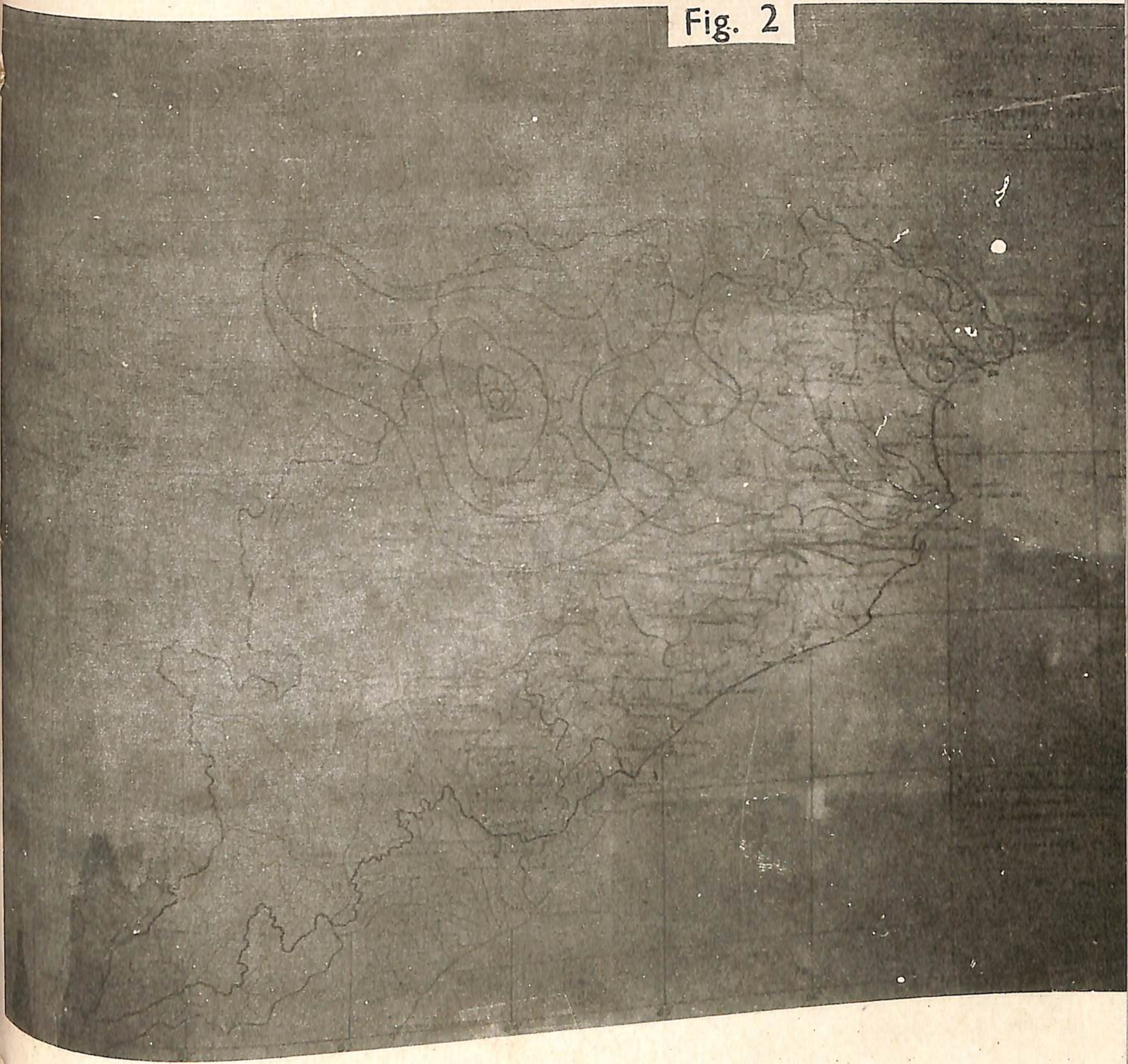
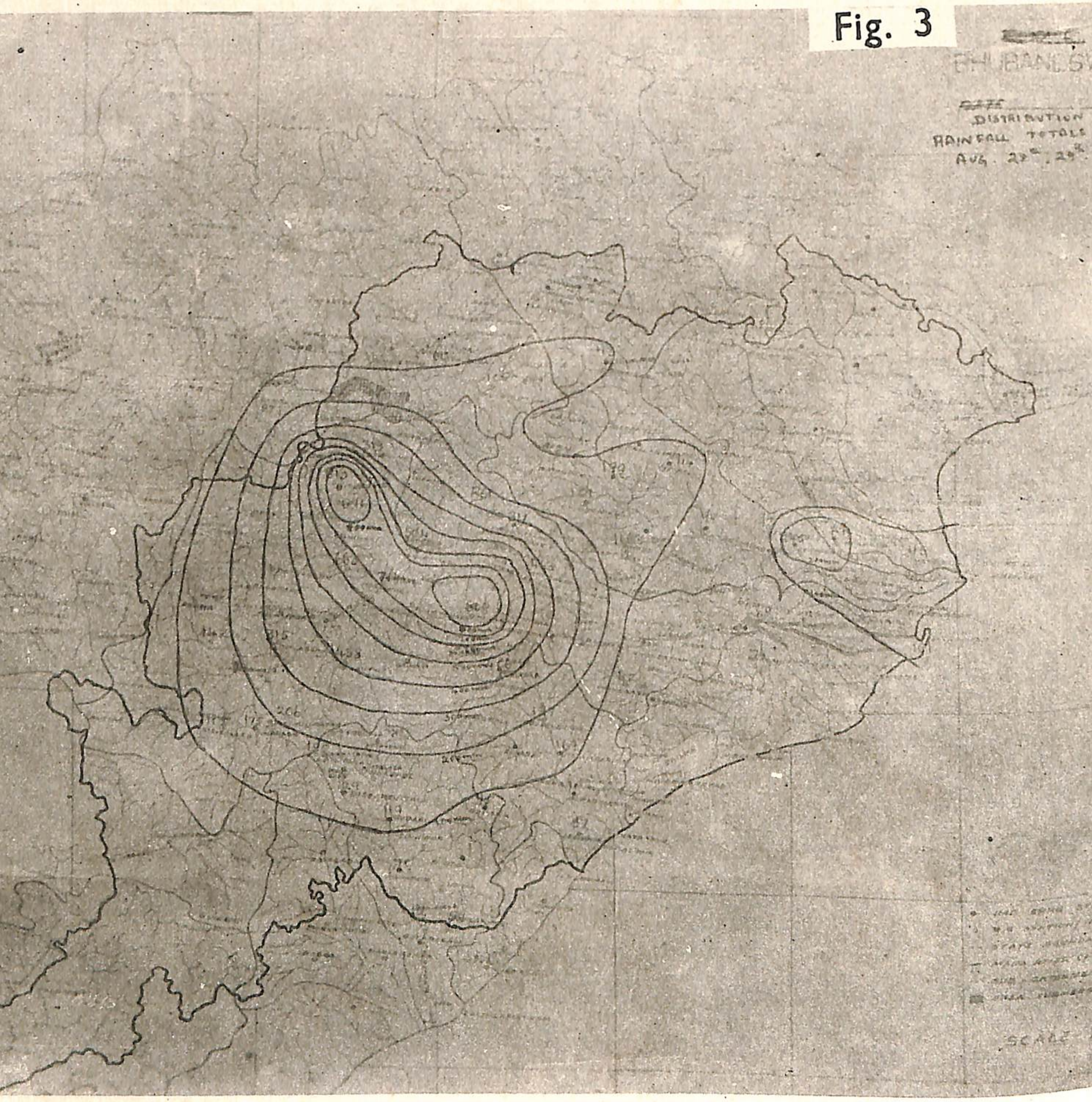


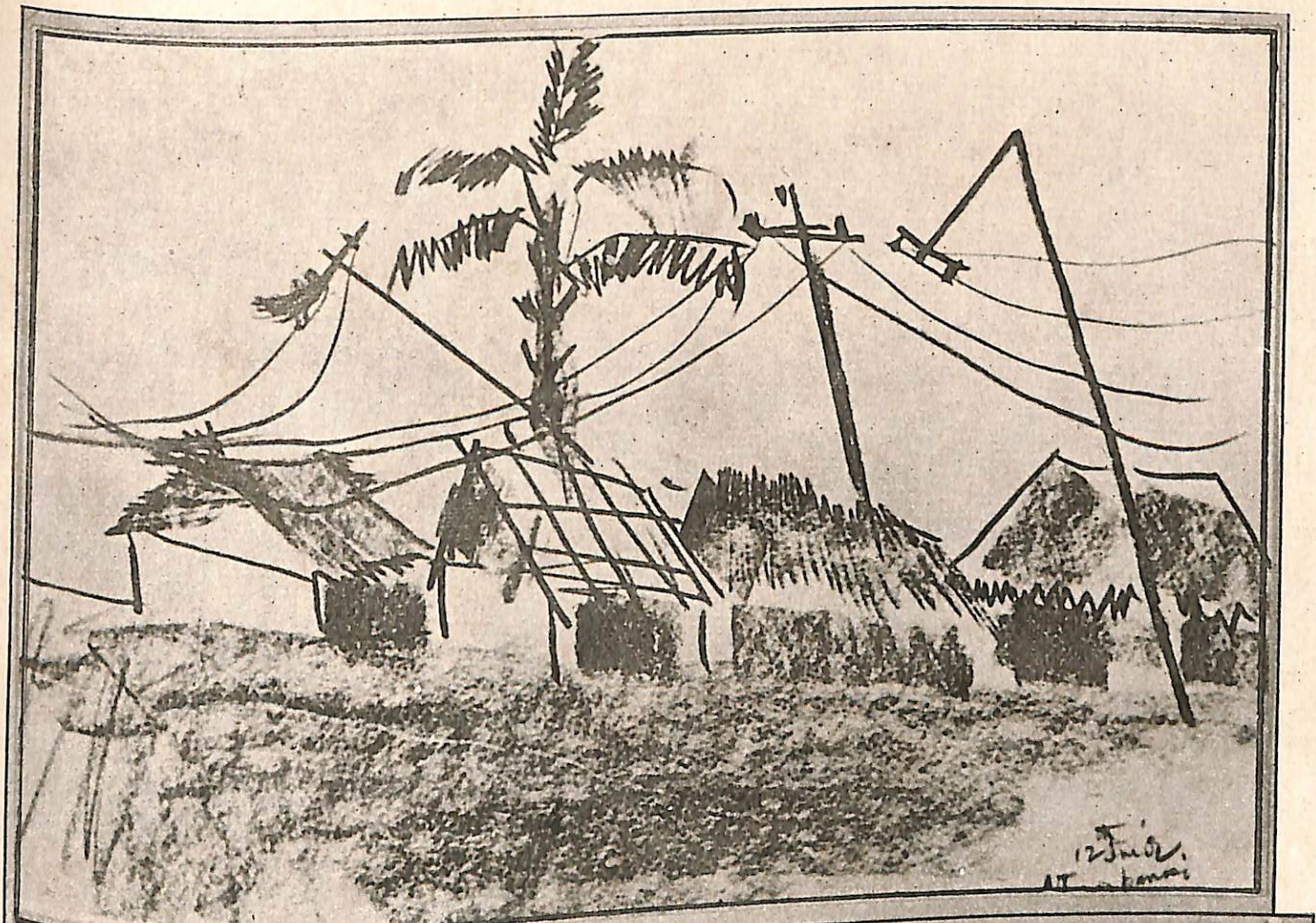
Fig. 3

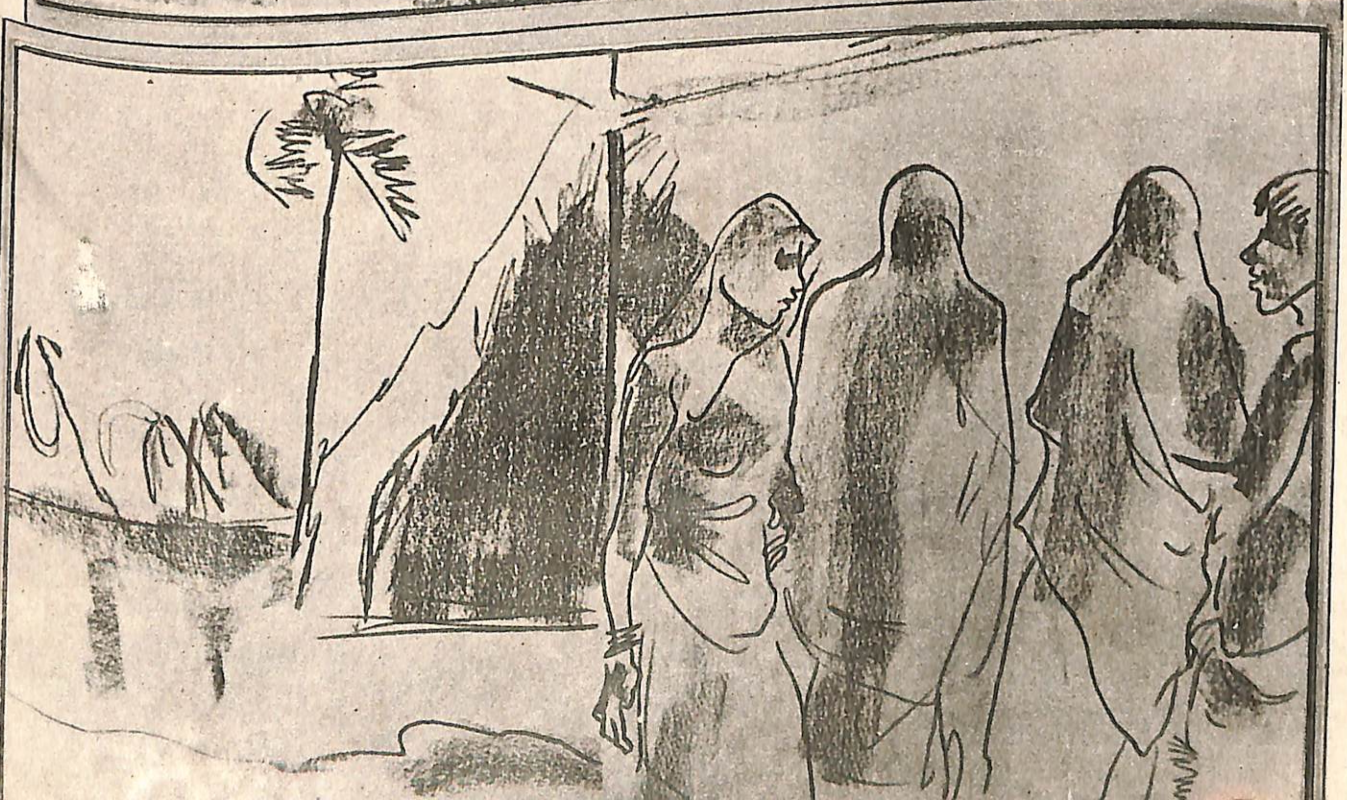

BHUBANESW
DISTRIBUTION
RAINFALL TOTALS
AUG. 27th, 28th
SCALE

CYCLONE, JUNE 1982

Some Sketches by Shri Jatin Das

(Based on photographs of Shri Raghu Rai, New Delhi)





Floods in Orissa—A resume

Shri Sudam Charan Patnaik

Introduction :

The coastal districts of Orissa being of deltaic character have been subjected to the ravages of floods from time immemorial. Floods in the deltaic regions are a natural phenomena and are as old as the land but their ravages tell a grim and sorrowful tale of the sufferings of the people. Since the early thirties of the nineteenth century the determined efforts of people for survival have led to lunching of a constant fight against Nature though with mixed success at times. Nature has, however, descended from time to time, with renewed fury causing destruction, damage and loss of life in large measure.

Cause of flood :

Heavy rainfall—The State is situated well within the tropical belt and the South-West Monsoon generally hits its coasts during the second week of June though a freakish weather delays the onset. The rainfall from S. W., Monsoon accounts for 75 to 90 per cent of the total rainfall. August is the rainiest month of the year. The sky remains overcast in the months of July and August with heavy formations of rain bearing clouds. Generally eight to ten depressions occur in the Bay of Bengal during the rainy season and the storm of the Cyclonic currents, due to depressions. leads its way in N. W. direction. These depressions lie heavily centred leading to heavy precopitation in the catchment areas of all the rivers of Orissa.

Upward Variation in sea Level—Another contributory cause of inundation is the upward variation in the level of Sea, S. W. Monsoon forces the Bay of Bengal and the estuaries in North-West direction raising the level of water on the mouths of the rivers. The upward variation in the level of sea caused by swollen tides during fullmoon period also plays an important role. In the result the flow of water from the rivers is arrested and the capacity of discharge is reduced. It is important to note that generally high floods have occurred during fullmoon tides and spring tides. The flood of 1982 is yet another instance which confirms to this phenomenon.

Sand-bars and sand-dunes—The third contributory cause of floods is the steady northward drift of the littoral sand-strip which forms sand-bars and sand-dunes at the river-mouths. Sand-bars are often elevated to high sand-dunes by the action of wind causing deviation in the routes of the rivers and often leading to choking the river-mouths. The rivers are unable to find direct outlets to the sea and hence the smooth and direct discharge of water gets hampered. The course of the river gets lengthened in finding a discharge-route which ultimately decreases the flood slope and increases the flood limits of the river.

Weak Embankments vrs. Strong Floods—Weak embankments or no embankment aside the rivers also contribute to devastating floods. There is a long gap in history which makes it difficult to trace when and how earthern embankments were constructed at the vulnerable places so as to train the course of rivers in the delta areas. It is believed that some of these embankments existed during the regime of Hindu rulers and in the Maratha period. The embankments were not properly maintained during the Maratha period and the British period. During the post-Independence period, the Government have tried to maintain the embankments properly. But the high floods at times surpass the strength of embankments and get vast areas marooned causing large scale devastations. The problems has, however, its limitation beyond which the inevitable happens the embankments have to give way when these become lower then level of flood water.

Gauge reading records for the three major rivers (Mahanadi and Kathjori), (Brahmani and Baitarani) from the year 1855, and the years of high flood when the danger level in one or more rivers has been surpassed have been indicated below. It may be marked that flood in the rivers Mahanadi, Kathjori and Brahmani are more frequent, than in the river Baitarani.

Year (1)	Kathjori (Bellevue) D. L. 21 Ft. (2)	Mahanadi (Jobra-Upstream) D. L. 72 Ft. (3)	Brahmani (Jenapur) D. L. 66 Ft. (4)	Baitarani (Akhuapada) D. L. 63 Ft. (5)
1855 ..	27·10	..	..	..
1857 ..	27·40	..	..	..
1866 ..	22·90	73·25	..	..
1872 ..	27·70	75·95 (4th July)	..	..
1874 ..	25·80	73·70	..	60·50
1876 ..	25·00	73·00	65·35	60·50
1877 ..	23·90	72·40	66·60	64·40
1879 ..	26·90	75·30	67·10	60·50
1880 ..	23·50	73·10	65·35	59·90
1881 ..	24·20	73·00	69·25	65·60
1882 ..	21·50	69·10	67·80	60·60
1883 ..	22·00	70·69	67·70	61·30
1885 ..	26·00	..	65·45	58·30
1888 ..	21·30	70·20	66·70	61·40
1892 ..	27·50	75·78	66·40	61·60
1893 ..	22·73	70·91	66·10	63·55
1894 ..	24·50	73·40	69·60	64·30
1895 ..	25·50	74·27	66·10	59·45
1896 ..	27·37	75·60	68·80	65·30
1897 ..	20·30	78·20	64·70	57·93

Year (1)		Kathjori (Bellevue) D. L. 21 Ft. (2)	Mahanadi (Jobra-Upstream) D. L. 72 Ft. (3)	Brahmani (Jenapur) D. L. 66 Ft. (4)	Baitarani (Akhuapada) D. L. 63 Ft. (5)
1900	..	24·50	73·00	66·20	66·00
1902	..	19·00	69·20	67·00	64·10
1904	..	24·12	72·20	66·80	66·00
1906	..	19·00	70·00	66·90	63·90
1907	..	23·70	72·30	69·80	67·20
1908	..	23·00	71·00	67·60	60·80
1909	..	21·62	70·00	66·10	61·90
1910	..	25·12	73·40	65·60	60·60
1911	..	27·80	75·00	67·20	59·80
1912	..	19·90	69·80	67·30	62·00
1913	..	22·57	71·90	69·50	67·60
1914	..	24·60	73·40	60·60	60·40
1915	..	23·30	71·50	63·00	59·90
1917	..	24·10	73·00	66·60	60·60
1918	..	24·00	73·60	63·95	60·00
1919	..	24·50	72·90	64·20	60·80
1920	..	26·75	74·60	70·10	66·90
1921	..	21·40	71·30	67·20	58·90
1922	..	20·60	70·10	66·80	62·10
1923	..	22·65	71·20	69·60	60·00
1924	..	21·50	70·50	63·60	58·10
1925	..	26·00	73·50	76·60	64·00
1926	..	27·35	75·40	71·00	62·00
1927	..	22·75	70·10	68·30	..
1928	..	21·60	71·30	65·40	63·90
1929	..	25·70	74·00	70·29	62·00
1930	..	22·15	70·70	64·40	60·90
1931	..	24·50	72·70	68·60	63·00

Year (1)	Kathjori (Bellevue) D. L. 21 Ft. (2)	Mahanadi (Jobra-Upstream) D. L. 72 Ft. (3)	Brahmani (Jenapur) D. L. 66 Ft. (4)	Baitarani (Akhuapada) D. L. 63 Ft. (5)
1932	22·60	70·70	68·00	62·70
1933	27·35	75·55	66·40	62·70
1934	24·85	73·00	68·10	62·50
1935	21·75	70·00	67·90	60·50
1936	22·20	70·40	68·40	60·30
1937	27·25	75·35	67·80	62·10
1938	21·75	70·40	67·60	57·90
1939	26·25	74·85	68·50	61·90
1940	26·50	75·35	70·80	68·60
1941	20·10	70·95	68·50	67·80
1942	23·50	72·40	67·90	62·10
1943	23·95	72·80	71·30 7th August	67·50
1944	25·00	74·10	67·20	63·00
1945	23·00	71·20	65·60	61·20
1946	25·83	74·05	Not recorded	74·70
1947	26·25	74·40	61·70	57·80
1948	24·00	72·50	Not recorded	58·80
1950	24·50	72·50	Not recorded	63·70
1952	21·60	72·10	68·80	60·20
1953	23·00	72·40	67·10	61·20
1955	27·00 (6th September 7 A. M.)	76·20 (5th September)	72·20 (4th September)	64·10 (4th September)
1980	..	..	Below danger level.	Below danger level.
1982	28·75 (31st August)	77·20 (31st August 5 P. M.)	Below danger level.	Below danger level

Statistical details of rivers Mahanadi, Brahmani and Baitarani are given below :

Sl. No. (1)	Statistical details (2)	Mahanadi (3)	Brahmani (4)	Baitarani (5)
1	Length of the river (Miles) ..	533	438	215
2	Length of the Delta (Miles) ..	67	93	62
3	Water shed Area (Thousand Sq. Miles)	51	14	4
4	Volume of water in the river at the commencement of the delta—			
	(*i*) Maximum flow-cusecs ..	15,71,000	6,43,290	5,00,000
	(*ii*) Minimum flow-cusecs ..	200	130	74
5	Area of the Delta (Sq. Miles) ..	2,940	854	659
6	Area normally in undated by floods (Sq. miles).	475	230	140
7	Length of embankment (Miles) ..	751	178	100

In 1955 the floods breached as many as 832 points details of which are given below:—

Sl. No. (1)	District (2)	Sub-division (3)	Private and Revenue embankment (4)	P. W. D. river and canal embankments (5)	Revenue District and Board and Private roads (6)	P. W. D. Roads (7)	Total No. of breaches (8)
1	Cuttack ..	Sadar ..	41	23	105	15	184
		Jajpur ..	17	52	17	5	91
		Kendrapara .	6	11	21	2	40
		Athgarh ..	16	2	6	2	40
		Banki Zone	1	..	..	2	3
		Total ..	81	88	149	26	344

Sl. No.	District	Sub division	Private and Revenue embankment	P. W. D. river and canal embankments	Revenue district and Board and Private roads	P. W. D. Roads	Total No. of breaches
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2	Balasore	Bhadrak	26	5	35	1	67
3	Puri	Sadar	33	10	24	4	71
		Khurda	8	..	..	..	8
		Nayagarh	1	64	59	3	127
		Total	42	74	83	7	206
4	Dhenkanal	Sadar	3	..	8	2	13
		Athamalik	2	8	40	1	43
		Angul	..	..	2	2	4
		Kamakhyanagar.	23	..	4	2	29
		Talcher	..	..	..	..	..
		Pallahara	6	..	18	1	25
		Total	34	..	72	8	114
5	Keonjhar	..	..	..	..	..	..
6	Bolangir	Sonepur	..	..	..	1	1
7	Sambalpur	..	..	..	..	..	..
8	Ganjam	Chatrapur	59	11	10	..	80
	..	Ghumsar	4	14	..	1	20
		Total	64	25	10	1	100
9	Phulbani	Boudh	..	..	..	..	..
		Grand Total	247	192	349	44	832

In 1955 floods, 3,003 houses were completely damaged and 58,717 houses were partly damaged. The number of human casualty was 79 and the livestock casualty was 2,886.

Foods *in* August-September 1982

1982-A year of misfortune—The State of Orissa has faced three major natural calamities in course of a single year i. e. 1982. Cyclone hit Orissa on 3rd and 4th June, 1982. Severe drought situation developed in the entire State during June and July, owing to failure of rains for nearly six weeks. Hardly had the people got time to prepare themselves to meet the situation created by the drought and cyclone, they were cought once again by an unprecedented flood during the period from 29th August to 1st September, 1982. This current flood is the highest during the twentieth century and nineteenth century since 1985 and it is the worst-ever flood experienced in living memory. It has surpassed the harrowing devastations of 1892, 1911, 1933 and 1955.

Unusual and unprecedented flood—The current year's flood has not even spared Sambalpur, Kalahandi, Bolangir, Boudh-Khandmals and Dhenkanal districts which are not usually prone to such heavy floods. The heavily centred precipitation in the catchment of river Mahanadi down-stream Hirakud Dam Project poured as much as 531 mm. at Bijepur, 484 mm. at Phulbani and 338 mm. at Sonepur on 30th August, 1982 alone. The excessive rainfall on 29th August, 1982 and 30th August, 1982 taken together gives the picture that Phulbani received rainfall of 693 mm., Kantamal 681 mm., Bijepur 671 mm., Sonepur 558 mm., Harabhanga 503 mm., Madanpur-Rampur 430 mm, Kesinga 397 mm., Karlamunda 348 mm., Nuagan 337 mm., and Rajkisorenagar 297 mm. This was anticipated from the Q. P. F. for Mahanadi upper catchment, Mahanadi lower catchment and Rushikulya catchment from 27th August 1982 to 30th August 1982.

—		Mahanadi upper catchment (whole basin)	Mahanadi lower catchment (whole basin)	Rushikulya catchment (whole basin)
27-8-1982	..	26·50 MM.	51·100 MM.	51·100 MM.
28-8-1982	..	26·50 MM.	51·100 MM.	11·25 MM.
29-8-1982	..	51·100 MM.	51·100 MM.	26·50 MM.
30-8-1982	..	26·50 MM.	11·25 MM.	11·25 MM.

The heavy wide-spread rainfall is the singular factor for creation of this high flood. The special feature of this present flood is that it occurred though there was no discharge of water from the Hirakud reservoir. Had there been any release from the reservoir, the flood would have been much more serious and the magnitude of the resultant flood would have been more severe in nature. The heavy rainfall was due to mainly a depression which lay centred at 08·30 hours I. S. T. on the 28th August, 1982 close to North Orissa Coast near latitude 20·5° North, moved North-West to lay centred in North interior Orissa and resulted in heavy rainfall in the districts of Balangir, Sambalpur, Kalahandi, Phulbani, Dhenkanal and Cuttack.

The flood water over-flowed the banks of river Mahanadi and all its tributaries and branches and breached at more than 500 places causing serious havoc in Sambalpur, Kalahandi, Balangir, Boudh-Khandmals (Phulbani), Dhenkanal, Cuttack and Puri districts. River Rushikulya caused damages in Ganjam district though in a less intense from. The most unusual feature of this flood is that it has affected the districts of Sambalpur, Kalahandi, Balangir, Phulbani and Dhenkanal which are not prone to flood being situated on the upper basin of the river Mahanadi.

Gauge reading records of high flood—Due precautionary measures were undertaken from 29th August, 1982 onwards.

Announcements were made in All-India Radio warning the people to shift from the low lying areas to higher places offering safety. The officers in the field were alerted sufficiently ahead of the oncoming of floods. Immediately after the heavy down-pour on the 29th August, 1982 the river Mahanadi started rising. The peak was reached at the head of the Delta at Naraj at 17·00 Hrs. of 31st August 1982 which recorded a gauge of 27·61 meters and remained steady up to 23·00 hours on the same day against the danger level of 26·62 meters. At Jobra (Cuttack) the water level was 77·20′ (up-stream) on the 31st August 1982 surpassing the highest recorded level of 76·20′ in the year 1956. Similarly the water level of river. Kathjori at Bellevue (Cuttack) was 28·75 at 18·00 hours of 31st August 1982 exceeding the highest level of 28·40′ recorded in the year 1933 against the danger level of 21′.

Rescue and relief operation—Rescue and relief operations have promptly started in full swing from the 31st August, 1982 in the affected areas. In order to meet the situation arising out of such unprecedented floods the normal administration was partially switched off and the entire machinery was geared up to face the emergency. Government set themselves as their primary task to the rescue and relief of the marooned and flood affected people. To augment the efforts of the Government in saving the people from distress and intensify the relief operation, army personnel and trained contigents of West Bengal, Civil Defence Emergency Force were requisitioned to help in rescure operations. Since 31st morning air dropping of food packets, medicines and other necessary accessories had commenced in the marooned areas, Emergent reilef was administered for seven to ten days in the affected area according to the necessity.

Damages—Severe damages have been caused to the life and property on account of this unprecedented high flood in about 114 blocks in 8 districts viz. Cuttack, Puri, Ganjam, Phulbani, Dhenkanal, Balangir, Sambalpur and Kalahand seriously affecting a population of about 5·4 millions and an approximate area of 90,000 Sq. Kms. Of these districts, Balangir, Dhenkanal, Phulbanl, Kalahandi and Sambalpur had never the experience of such severe flood in the past. The flood has affected 4·6 millions of people in Cuttack and Puri districts only because there is heavy concentration of population in these areas. Many parts of the State were submerged by 3′ to 10′, standing flood water, 7 Municipalities, 16 N. A. Cs., 24 Subdivisions and 9,289 villages have been seriously affected. 131 persons have lost their lives owing to the floods. The fewer casuality is on account of the warning system which was near perfect. The casualty of cattle stands at 39,692.

Breaches in embankments. Rail and Road communication disrupted—River Mahanadi and its tributaries and branches have breached at more than 500 places some of the breaches ranging 300′ to 1,500′. The most serious breach occurred in river Devi—a branch of Mahanadi at Dalaighai at 3 places varying from 300′ to 1,200′. This embankment was last breached in 1955 creating havoc for nearly a million people in protected irigated areas of Cuttack districts. The embankments of the rivers in Mahanadi system and the canal embankments in Cuttack and Puri districts have been completely wrecked. According to the reports received more than 1000 breaches have occurred in canal embankments, 733 M. I. Projects and 1,677 L. I. Points have been damaged, Rail and road communications have been very badly disrupted. The rail link between Cuttack and Bhubaneswar which was disconnected on the 31st August, 1982 was restored within three days. The road links between Bhubaneswar and Cuttack, Bhubaneswar-Puri and most of the roads in various interior parts of the State which have been cut off have been restored. All the roads leading to Boudh and Banki towns were cut off from all sides. The same have however been restored within 4 days. A total of 39,934-Km. long road have been damaged. 16 Towns were cut off from the mainland.

The alluvial plains and vast stretches of rich fertile lands within, have been covered by flood water for about a week or so. The rich crops thriving well in these areas have been completely damaged. Approximately

11·25 lakh hectares cropped area have been damaged extensively. The havoc wrought by the flood to the embankments, canal system, life and property was ensurmountable. The present flood coming in quick succession after high flood, tornado, drought and cyclone leaves its indelible mark on the economy of the State already shattered by natural calamities in the past occurring with undesirable frequency.

Damages to private houses—Thousands of kutcha houses have either been washed away or completely collapsed. The number of such houses damaged in the current flood will be in the order of 3 lakhs and the number of houses partially collapsed will be also of the same magnitude. To save the flood affected people from distress and to ameliorate their miserable condition temporary sheds have been provided as early as possible besides formulating plan and programmes for construction of moderately good and permanent houses with necessary living conditions.

Damages of Government buildings and public institutions—Similarly the public institutions and Government buildings have sustained substantial damage. The number of such buildings would approximately figure a lakh. Restoration of Government buildings and public institutions is immediately necessary which require house building materials like cement, M/s. rod, A. C. sheets, etc., on an entortive scale.

Drinking water scarcity—Drinking water scarcity is the most acute problem in the flood affected areas. Tube-wells, sanitary wells and most other drinking water sources have been damaged or rendered unfit for use. Most of the tube-wells damaged have since been repaired. Water supply has been ensured in the affected villages as far as possible. New Tube-wells have also been installed where possible.

Food Supply—The stock of rice available in the State towards the end of August, 1982 would have sufficed the normal requirement for September and October. But the present natural calamity of the greatest magnitude have consumed more than 10,000 tonnes as emergent relief and necessitated the urgency of an extra demand on the public distribution system. Since the economy is shattered due to complete failure of crops in the plain areas of Cuttack and Puri districts which are the granary of Orissa, the supply of rice will have to be continued till the harvest of the next Khariff crop. The requirement of rice emergent relief and public distribution system has been assessed at 88,000 M.T. from September to December.

Emergent Relief comprising of 1,09,590 quintals of rice and 10,075 quintals of Chuda besides Atta, Wheat, Pulses, Kerosene Oil and Salt was distributed at the shortest possible time in the affected areas where distress condition prevailed. The severely affected subdivisions have been placed in charge of Senior Officers of the rank of Additional District Magistrates to supervise the relief operations. Talaies, Polythene rolls and tarpaulins were also supplied to the affected people. House Building grant to the extent of more than Rs. 3 crores has been distributed to about 2,27,000 beneficiaries. Similarly ex *gratia* payment of Rs. 1,01,500 has been made to the bereaved families of the persons who have lost their lives due to the floods. With a view to encouraging rabi cultivation, 14 thousand quintals of seeds like biri, Mung, Arhar, groundnut have been distributed in the districts of Cuttack and Puri. Forest materials for construction of houses have been supplied in affected districts by opening additional 78 depots through the Forest Corporation. Power supply has been restored to almost all the villages where it was disrupted. Restoration of the damaged roads and closure of breaches in the embankments are in brisk progress. Steps have been taken to supply water in the major canals which had suffered breaches in many places and save the standing Kharif crops and to ensure rabi cultivation to be taken up on an extensive scale.

Assessment of cost or damages and efforts necessary for restoration works—With the available informations the details of damages have been prepared by various Departments of Government and the approximate amounts of requirement for repairs and restoration works have been highlighted to the Central Government in the memorandum for their assitance. In total, an estimated requirement of Rs. 618 crores has been projected in the memorandum.

Reconnaissance team under the Chairmanship of the Relief Commissioner to Government of India Shri K. C. S. Acharya and later under the leadership of Shri K. N. Choudhury, Advisery, Planning Commission have already visited different areas of Orissa which have been severely affected by floods for a detailed appreciation of the facts and the situation actully obtained in the field. The Teams have expressed their concern at the serious scale of the devastations caused and expressed their sympathy for the miserable plight of the affected people. The people are grateful to the Prime Minister of India for her visit to the State during the period of distress to share their sorrows and miseries and the State Goverment acknowledge with gratitude, the timely help and assistance of Government of India.

Cyclone-drought-flood-hailstorm is a phenomenon which the State has had the misfortune to experience in quick frequency and the State had no respite from this during the last two years. The Calender of Natural Calamities in Orissa is enumerated below :—

1834	..	Flood
1845	..	Flood
1846	..	Flood
1848	..	Flood
1851	..	Flood
1852	..	Flood
1853	..	Flood
1854	..	Flood
1855	..	Flood
1856	..	Flood
1857	..	Flood
1868	..	Flood
1872	..	Flood
1874	..	Flood
1877	..	Flood
1879	..	Flood
1880	..	Flood
1881	..	Flood
1885	..	Severe Cyclone (7973 human lives and 10,000 livestock lost).
1890	..	Strong cyclone
1892	..	Ditto
1893	...	Cyclone (pre-monsoon) & Saline Inundation.
1894	..	Flood
1895	..	Flood
1896	..	Flood
1900	..	Flood
1907	..	Flood
1908	..	Inundation
1911	..	Very High Flood
1913	..	Flood
1920	..	Flood
1926	..	Flood
1927	..	Flood
1929-30	..	Flood
1933	..	Very High Flood
1936	..	Cyclone
1937	..	Flood
1939	..	Flood
1943	..	Flood
1947	..	Flood
1955	..	Very High Flood (Daleighai damages).
1956	..	Flood
1961	..	Flood
1965	..	Severe Drought
1967	..	Severe Cyclone
1968	..	Cyclone
1969	..	Flood
1971	..	Severe cyclone
1972	..	Flood
1973	..	Flood
1975	..	Flood
1977	..	Flood
1978	..	Hailstorm, Whirlwind, Tornado (Puruna Bandhagoda).
1979	..	Drought
1980	..	Flood and Drought
1981	..	Tornado/Flood/Drought
1982	..	Hailstorm, strong and severe cyclone, Drought (Pre-monsoon), Heavy rainfall and Flood in Sambalpur, Highest Flood in 8 districts (All natural calamities occurred within almost first half of 1982-83).

Permanent measures—It is, therefore, high time that a permanent solution to the problems of floods and other natural calamities is found out. A strong protection wall could be laid by developing entire coastal line of 324 kilometres by thick forest growth and for plantation of fruit bearing trees like cashewnut and cocoanut and/or fuel species like casurina. Already a wing of the Government has been activised to operate the sea-coast development scheme. This needs to be implemented as expeditiously as possible. Dams to harmness the might Mahanadi and its tributaries down stream of Hirakud both for flood control and irrigation purposes need serious consideration. The construction of a dam at Manibhadra has already been contemplated and is pending consideration of the Government of India and the National Flood Control Commission.

Deputy Secretary to Government,
Revenue Department, Bhubaneswar.

CHIEF MINISTER PLEADS FOR LARGER CREDIT TO FLOOD HIT PEOPLE

To provide speedy, adequate and concessional loans to flood affected people, the Chief Minister, Shri J. B. Patnaik, had invited Shri Ramakrishnayya, Deputy Governor, Reserve Bank of India and Chairman, National Bank for Agricultural and Rural Development and senior representatives of Industrial Development Bank of India, Deposit and Credit Guarantee Corporation of India and State Bank of India. The Chief Minister had a discussion with them on October 13. He appealed to them to ensure speedy and adequate credit to flood affected people. Following decisions were taken to ensure larger flow of credit to the affected people:—

(*i*) Co-operatives and commercial Banks shall rephase the crop loans of current defaulters. As regards pre 1981 defaulters, genuine cases where conversion facilities were not availed of by Commercial Banks such cases will be considered. In case of co-operatives, for small and marginal farmers who are pre 1981 defaulters rephasing and fresh loans will be given if default does not exceed Rs. 1,000 per person.

(*ii*) Regarding sand cast lands the banks shall give loans up to Rs. 1,250 per hectare in addition to subsidy from the State Government.

(*iii*) For small scale village and cottage industries and artisans affected by floods, loans up to Rs. 25,000 at an interest rate of 5 per cent will be given.

(*iv*) House building loans of Rs. 5,000 per house will be given by commercial banks to members of scheduled caste and scheduled tribes at 4 per cent interest. For other persons HUDCO loans at 5 per cent interest for rural houses and 7 per cent interest for urban houses will be available.

(*v*) A large programme of dug wells would be mounted with the help of Co-operative Banks, Land Development Banks and Commercial Banks with assistance from National Bank of Agriculture and Rural Development. Comprehensive schemes will be prepared and sanctioned for this purpose.

These facilities agreed to by financing institutions and banks will help the flood affected people to quickly rehabilitate themselves.

THE ORISSA AGRO-INDUSTRIES CORPORATION LIMITED

(A GOVERNMENT OF ORISSA UNDERTAKING)

Regd. Office : **Killamaidan, Cuttack-753001**

In the Service of the Farmers of the State

- ✳ Orissa Agro-Industries Corporation extends its assistance to small and marginal farmers through Energisation of dug wells and Filter Point Tube-wells of TURNKEY basis and provide free after-sale service.

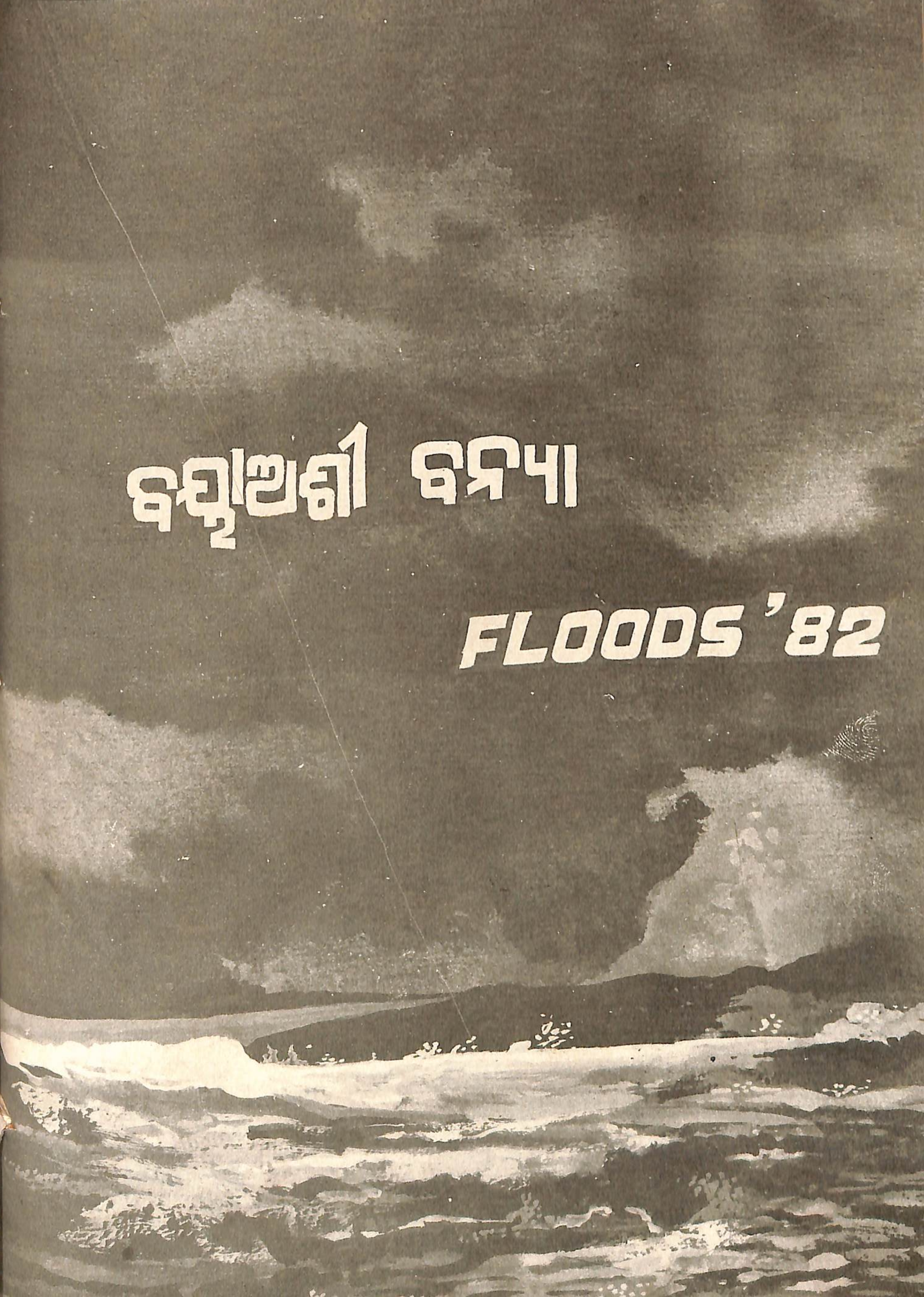
- ✳ OAIC is implementing Orissa Government's Special Programme for HARIJAN and TRIBAL Farmers in providing tube-wells and energised dug wells and necessary back-up services.

- ✳ With an aim to increase the Agricultural Productivity OAIC extends its helping hand to the rural poor providing fertilisers and pesticides at their door-steps through its State wide established, Rural Sales Centres, Private Dealers & R. C. M. S. at reasonable rate.

- ✳ OAIC helps Cattle and Poultry Development in the State by Manufacture and supply of balanced Cattle and Poultry feed at a competitive price. Our feed is the only product with ISI mark in the State.

ORISSA AGRO-INDUSTRIES CORPORATION HAS MAINTAINED AN EXPONENTIAL GROWTH RATE FOR THE LAST 6 YEARS IN THE FACE OF STIFF COMPETITION AND HAS PROVED TO BE REAL FRIEND PHILOSOPHER AND GUIDE OF THE FARMERS OF THE STATE.

P. C. PANDA, I. A. S.
Managing Director



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FLOODS '82

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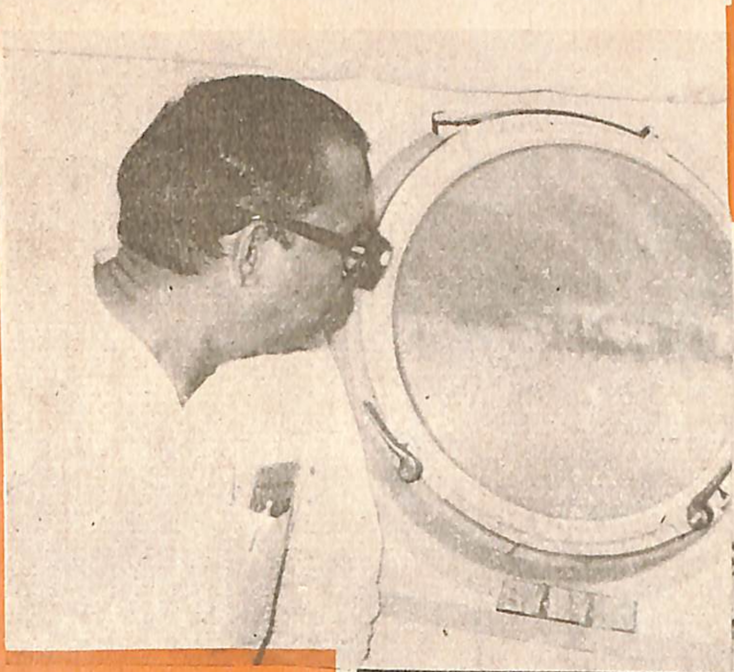

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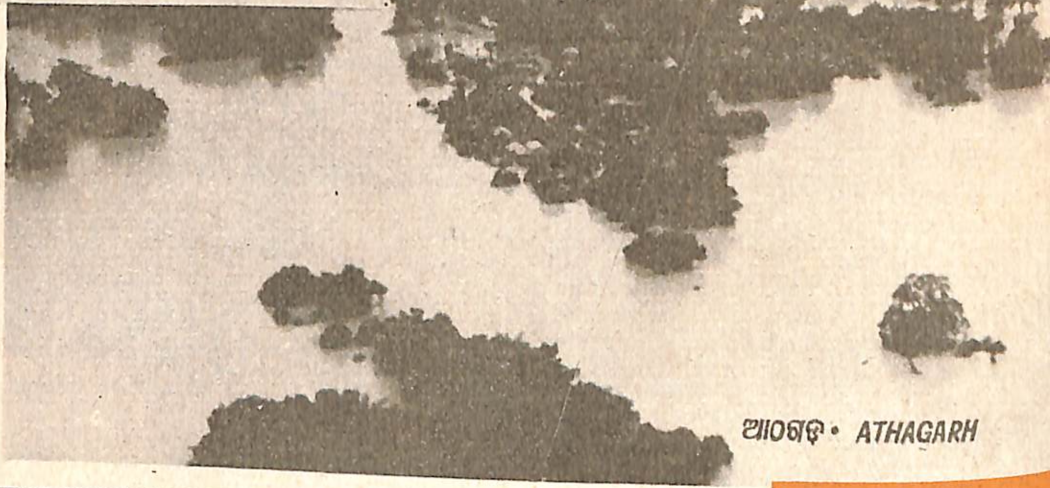

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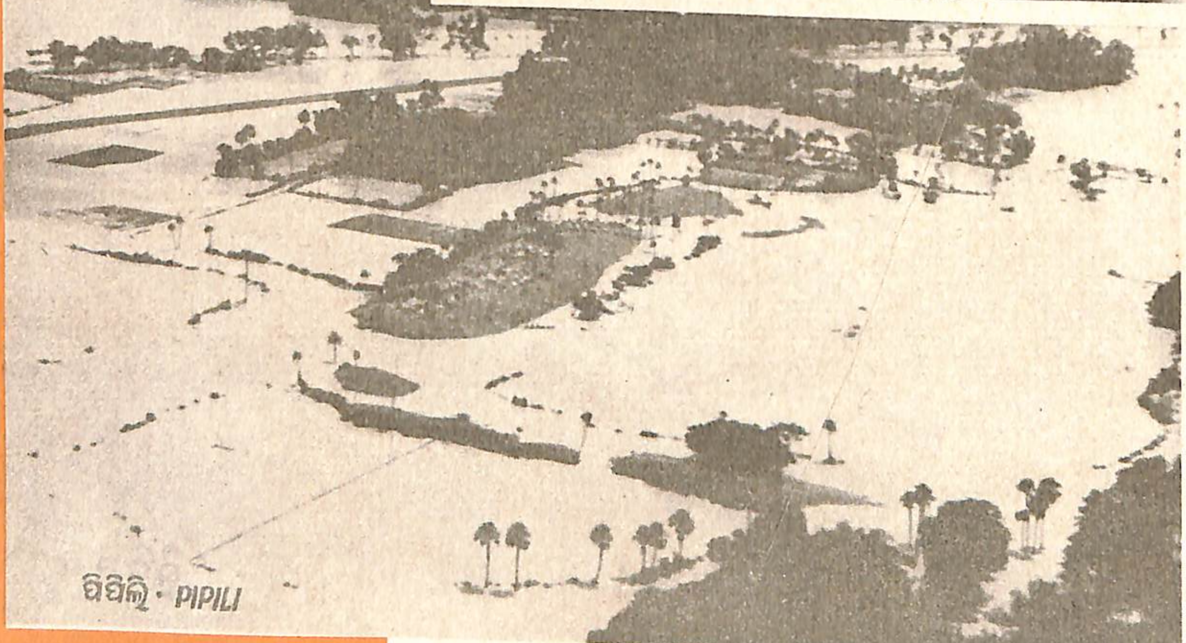

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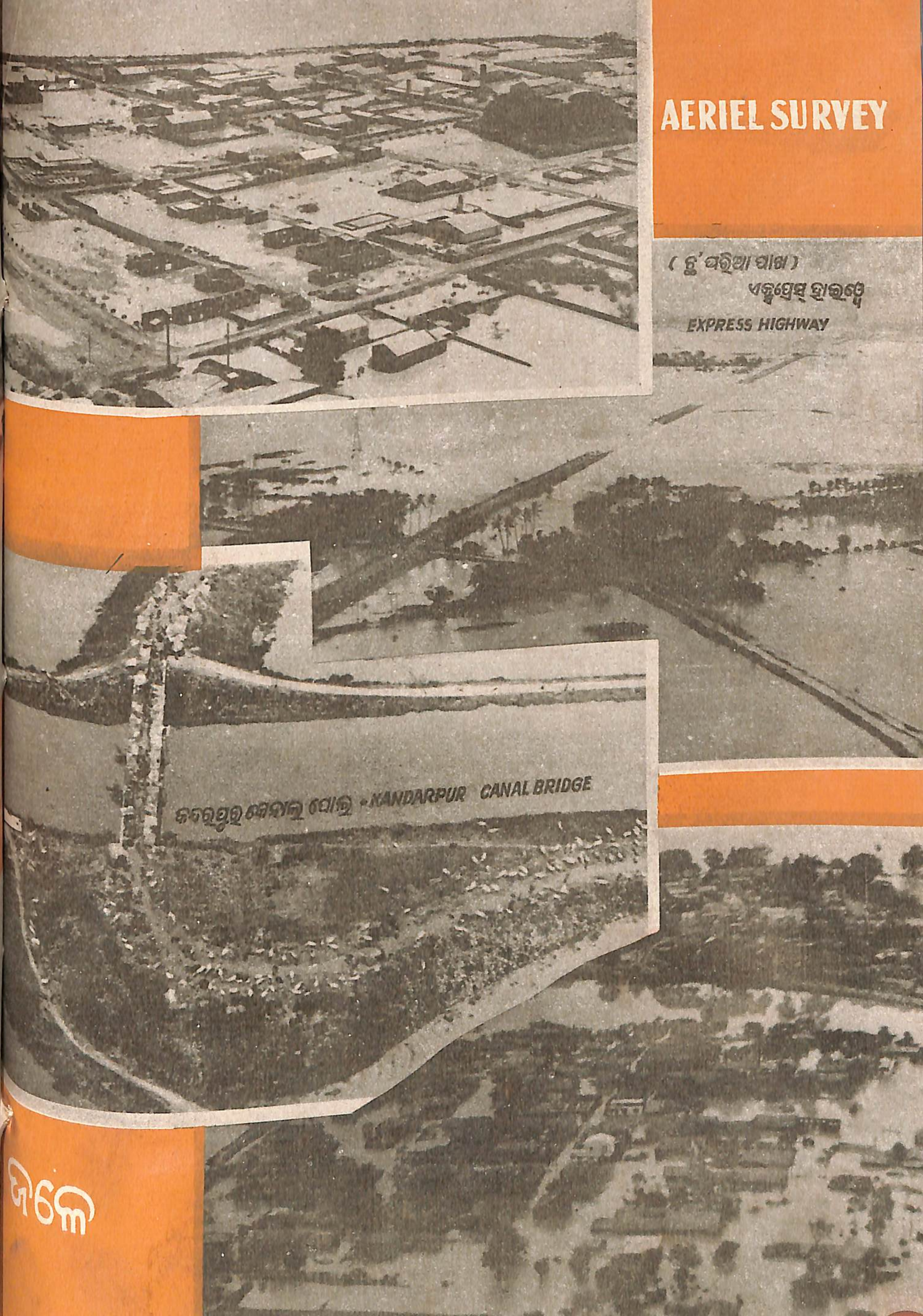
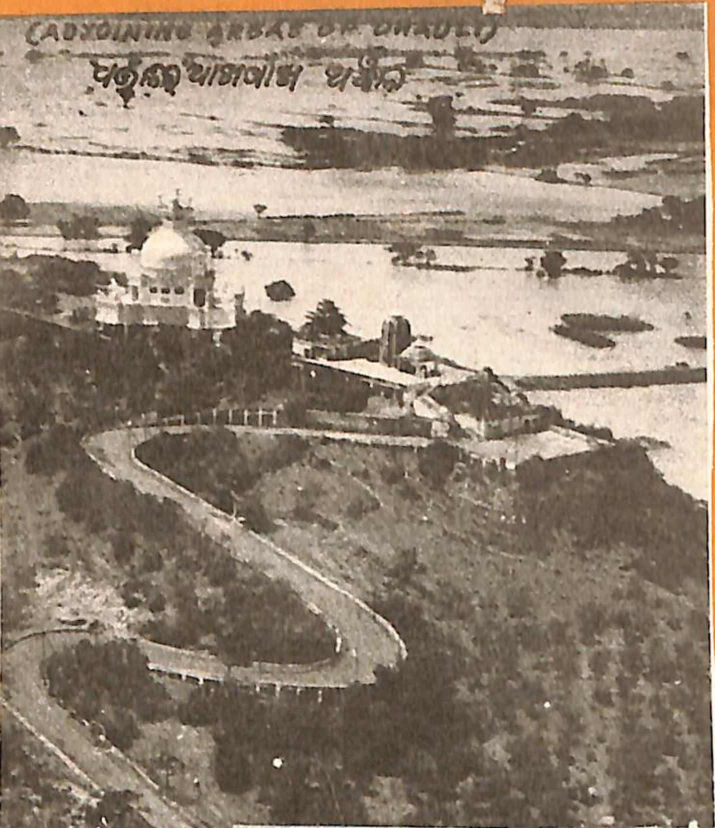
AERIEL SURVEY





(ADJOINING AREAS OF DHAULI)

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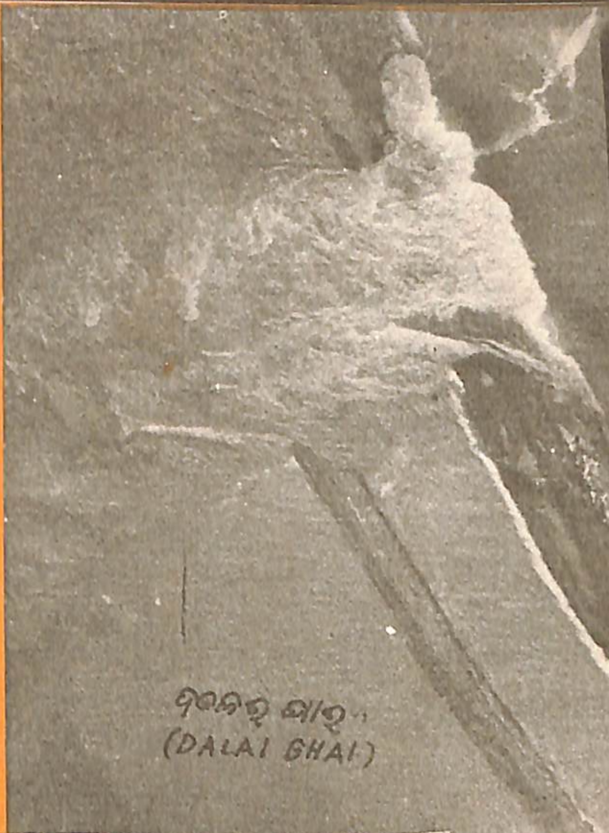

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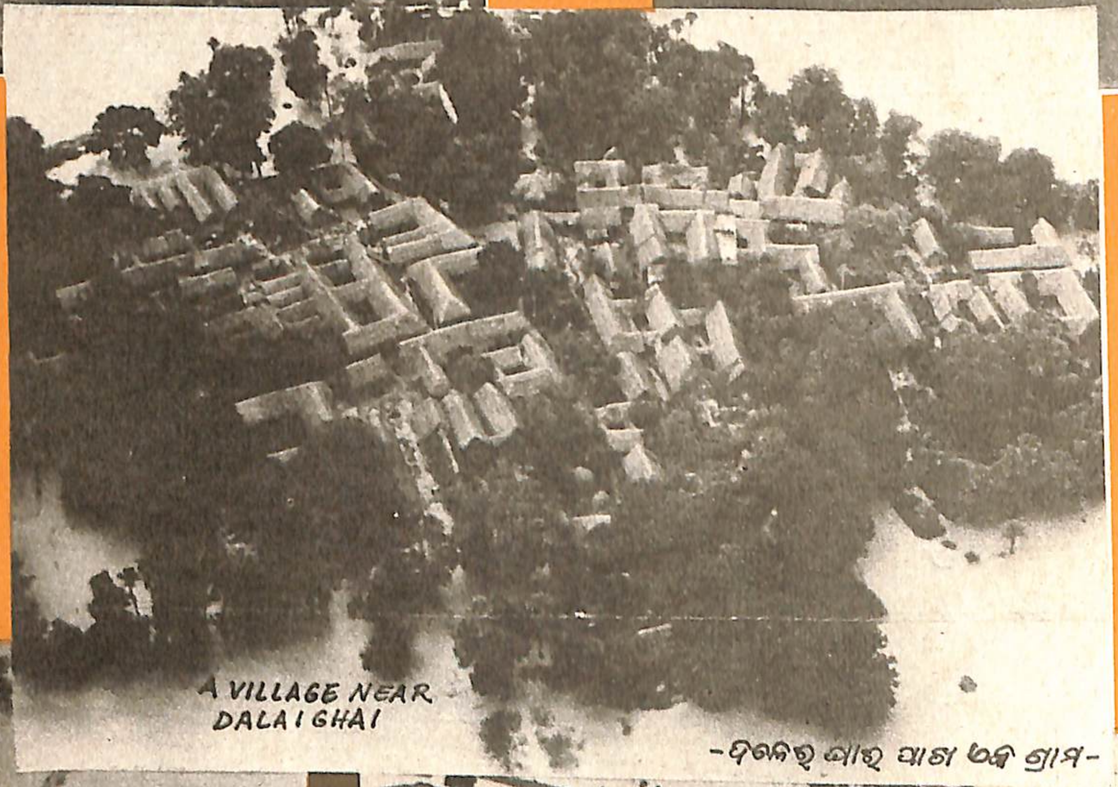
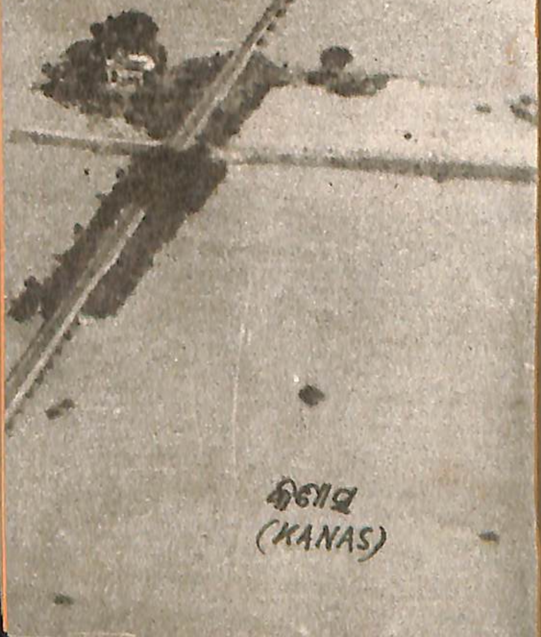
(DALAI GHAI)



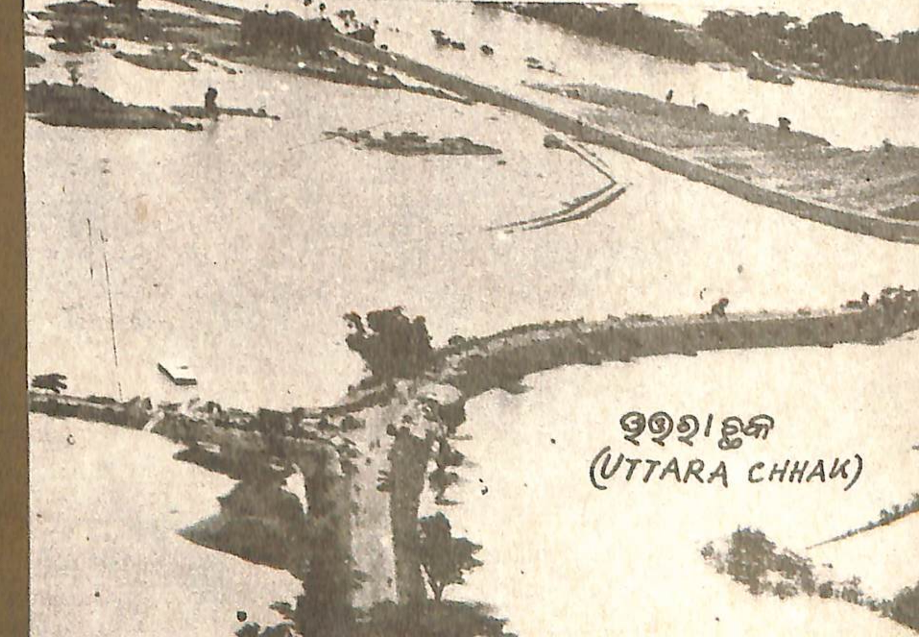
A VILLAGE NEAR DALAI GHAI

-ଦଳେଇ ଘାଇ ପାଖ ଏକ ଗ୍ରାମ-



କଣାସ

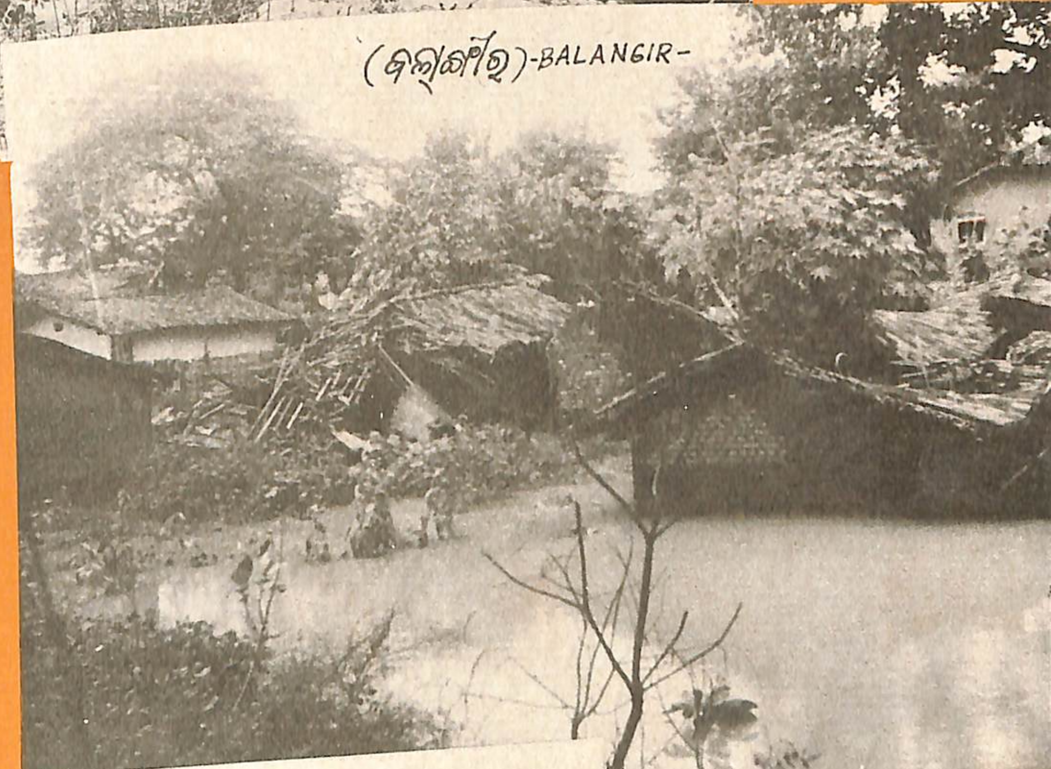
(KANAS)



ଉତ୍ତରା ଛକ

(UTTARA CHHAK)

(ବୟାଲିଶ ମୌଜା)
-BAYALIS MOUJA-

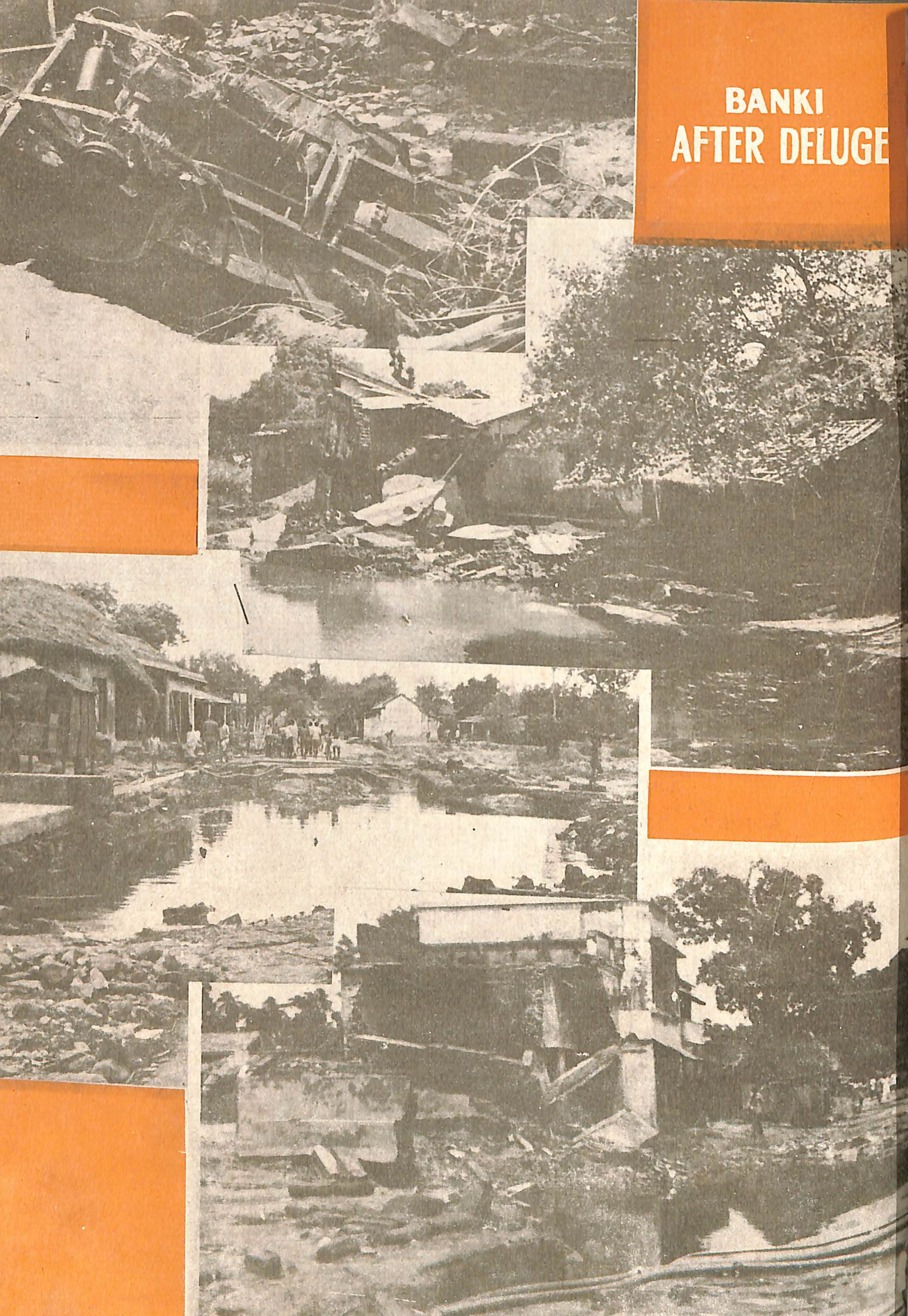

(ବଲାଙ୍ଗୀର)-BALANGIR-

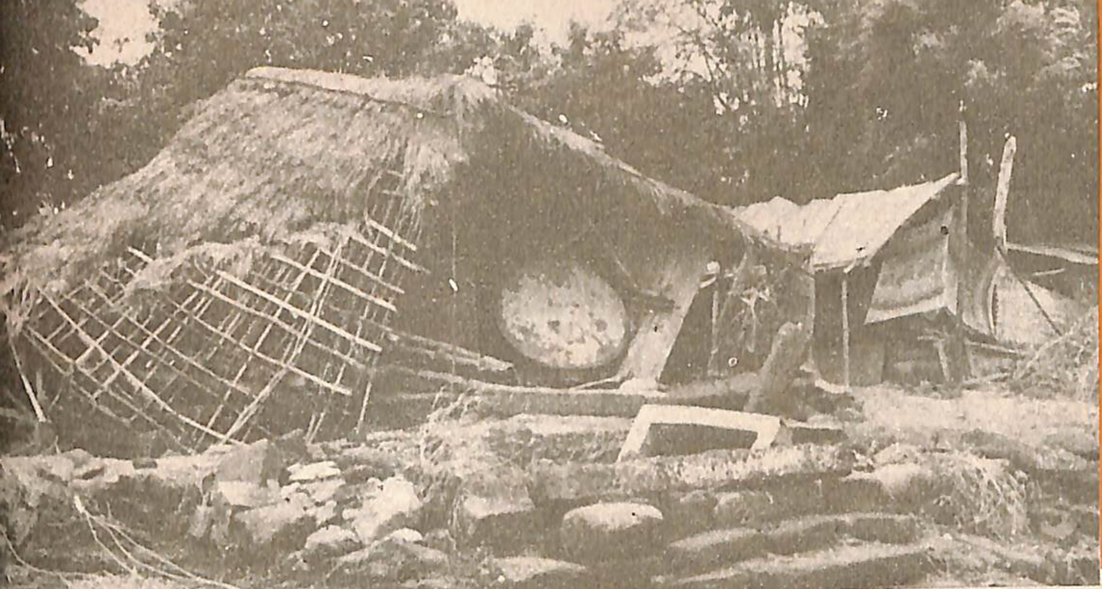
(ବୌଦ୍ଧ)-BOUDH-

ବନ୍ୟା ବିପର୍ଯ୍ୟୟ ...

FLOOD DEVASTATIO

BANKI
AFTER DELUGE





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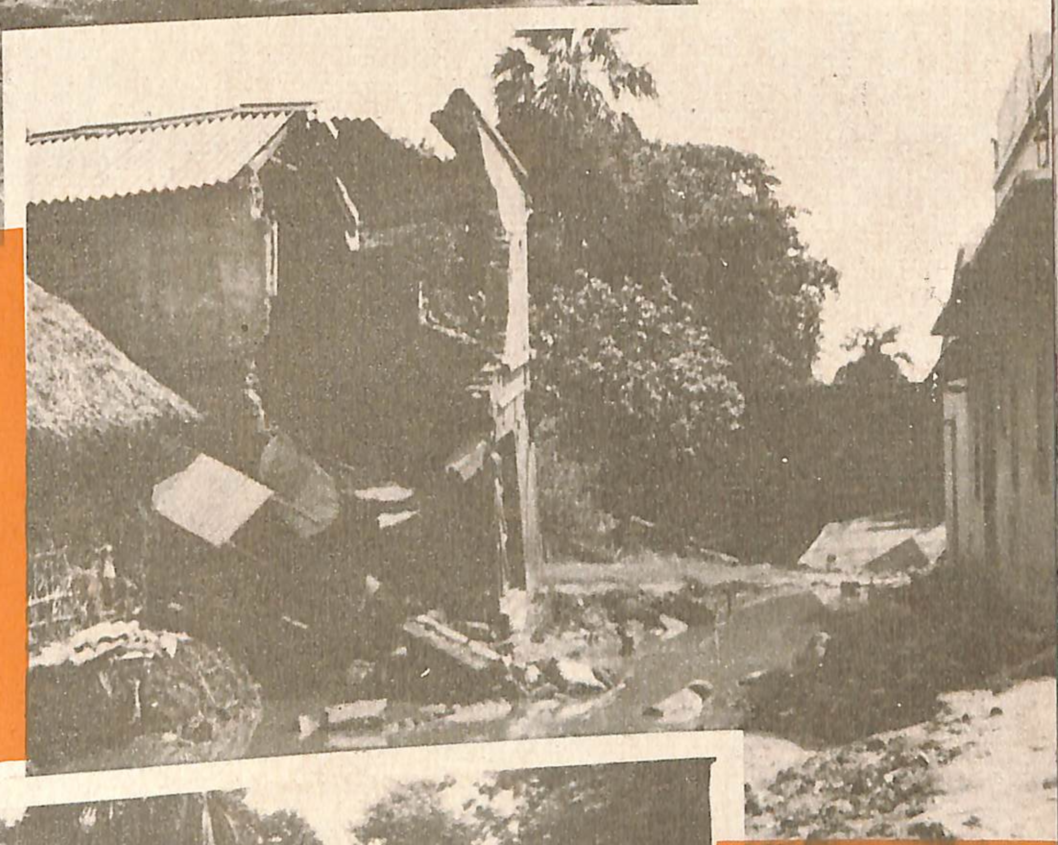
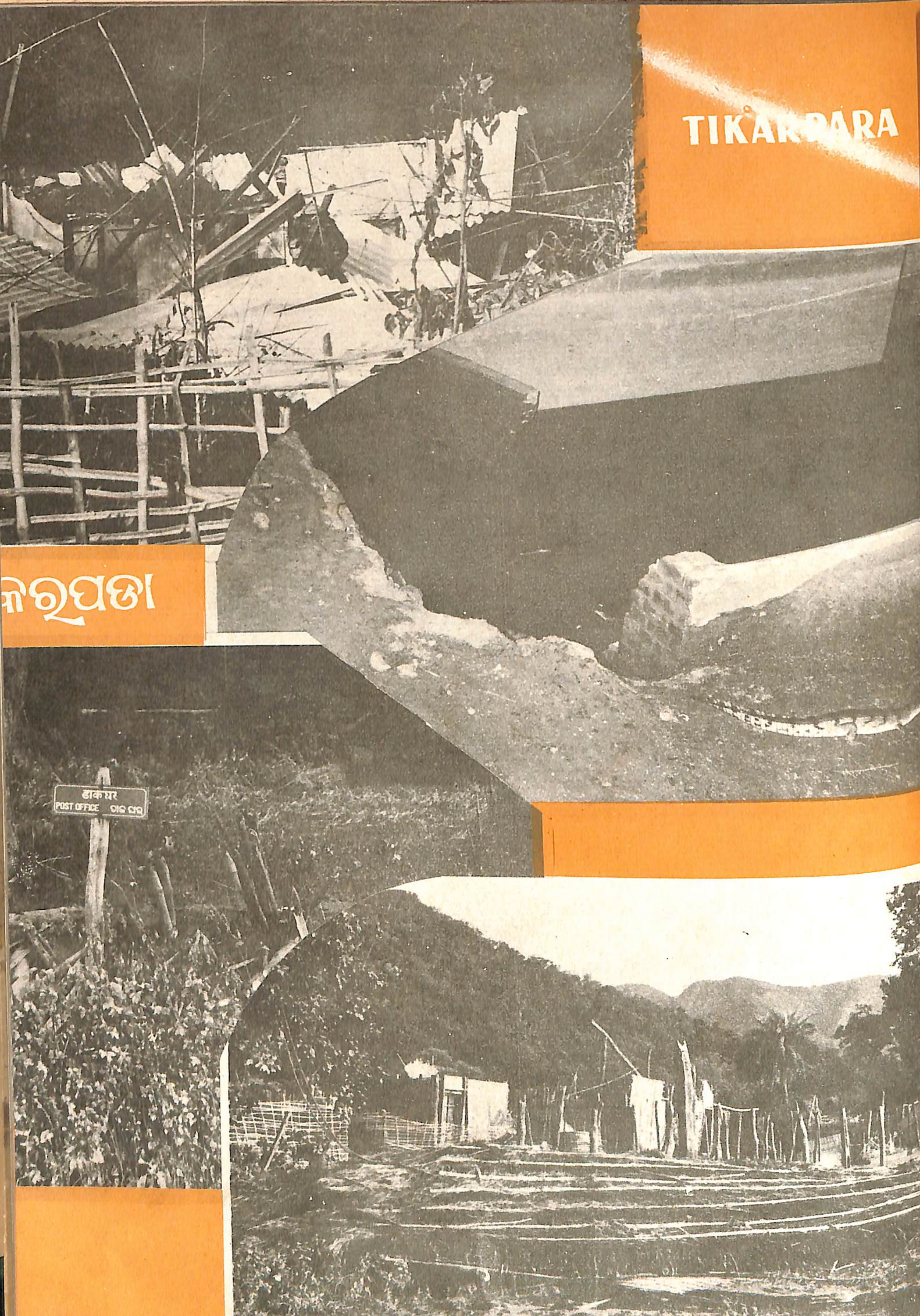
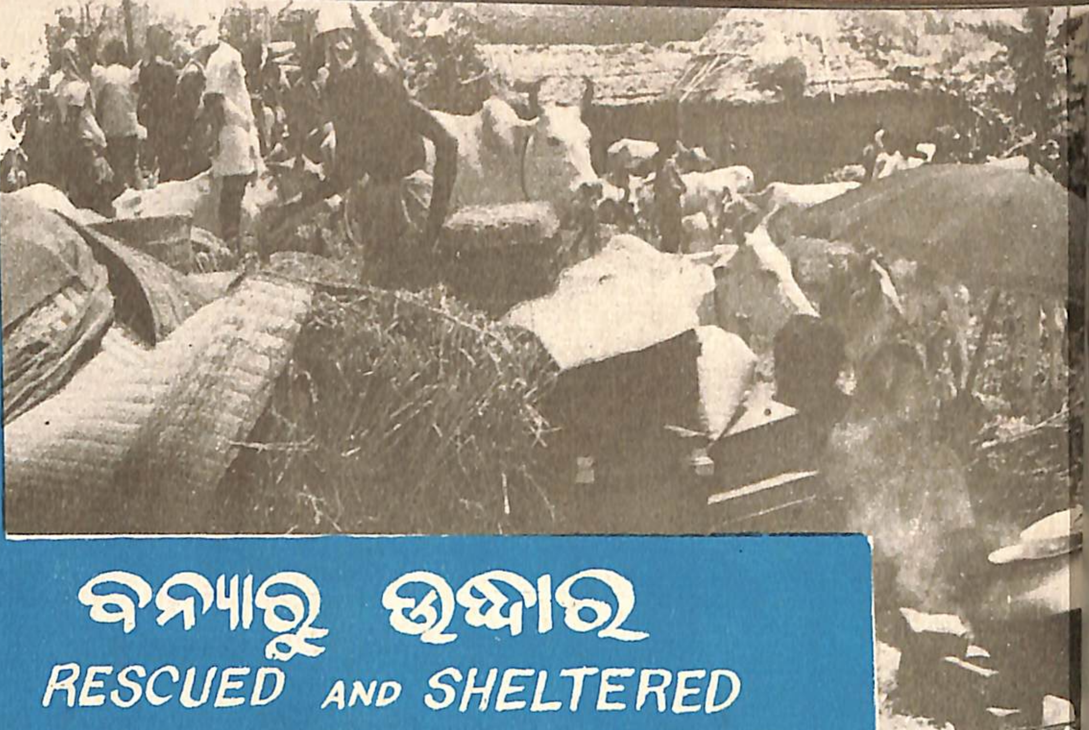


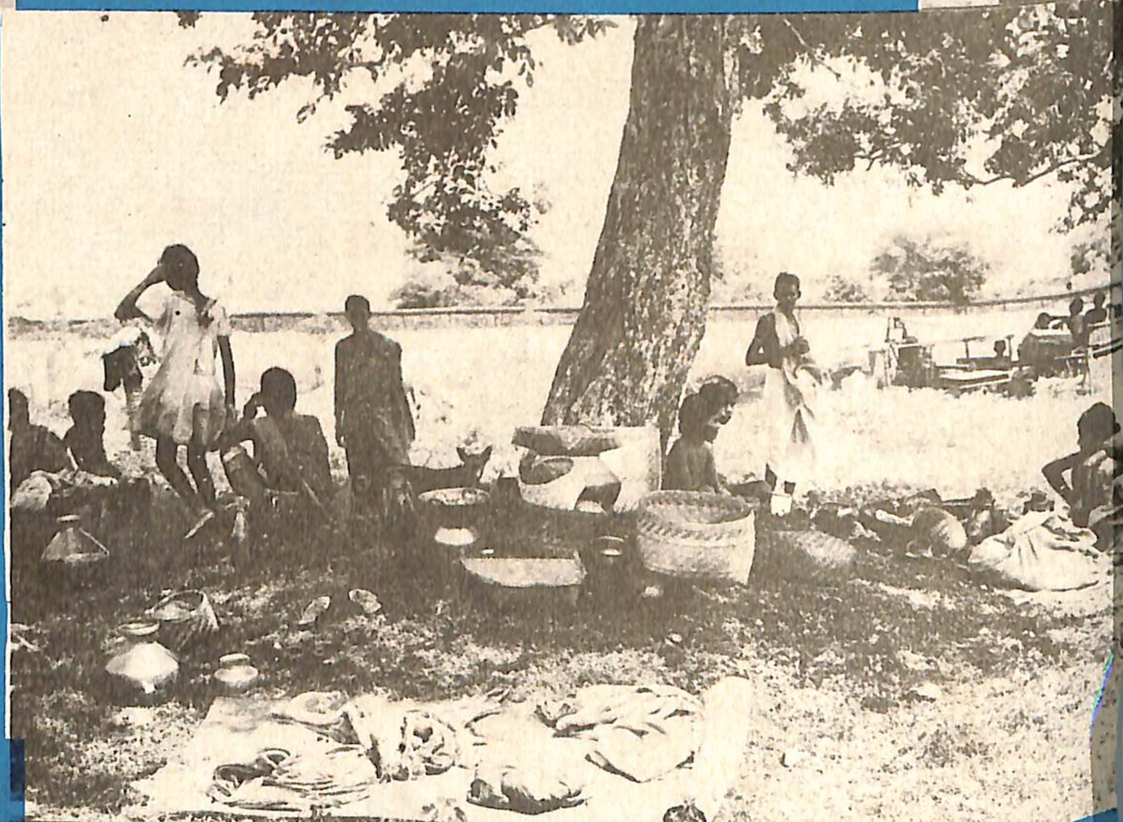

TIKARPARA
ରପଡା
डाकघर
POST OFFICE ଡାକ ଘର

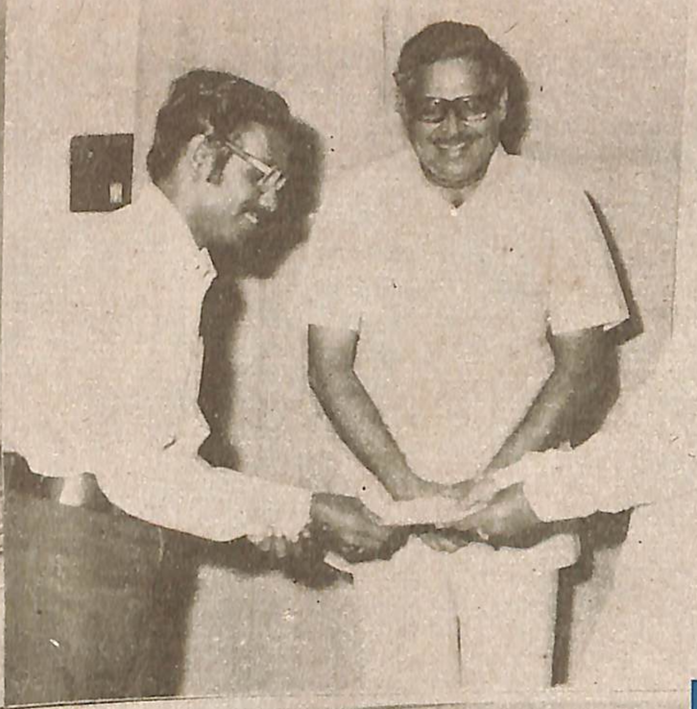
ଆକାଶ ମାର୍ଗରୁ ଖାଦ୍ୟ ଯୋଗାଣ

FOOD PACKETS AIR-DROPPED



ବନ୍ୟାରୁ ଉଦ୍ଧାର
RESCUED AND SHELTERED



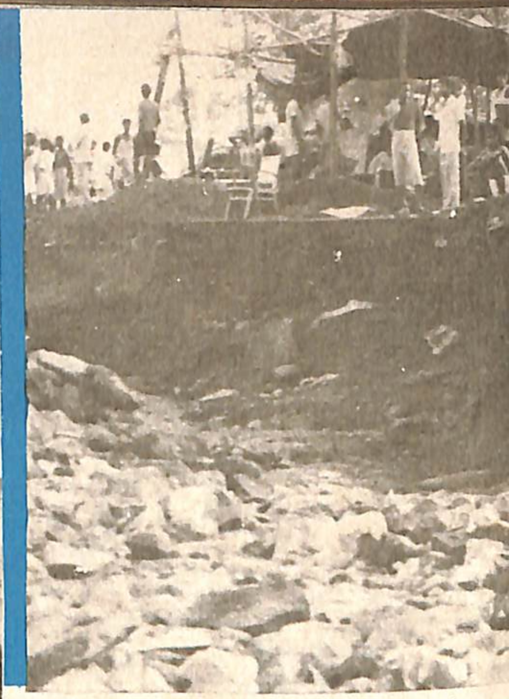


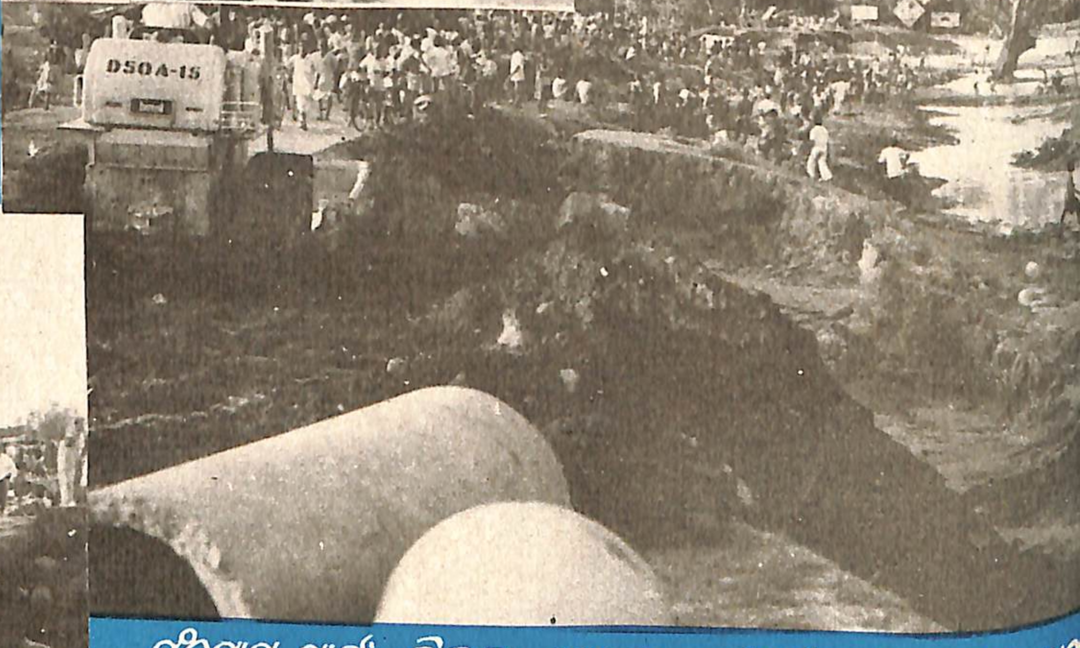
ସାହାଯ୍ୟ

PHILANTHROPISTS COME TO C.M's AID

ବାଙ୍କୀରୁ ଜଳ ନିଷ୍କାସନ,

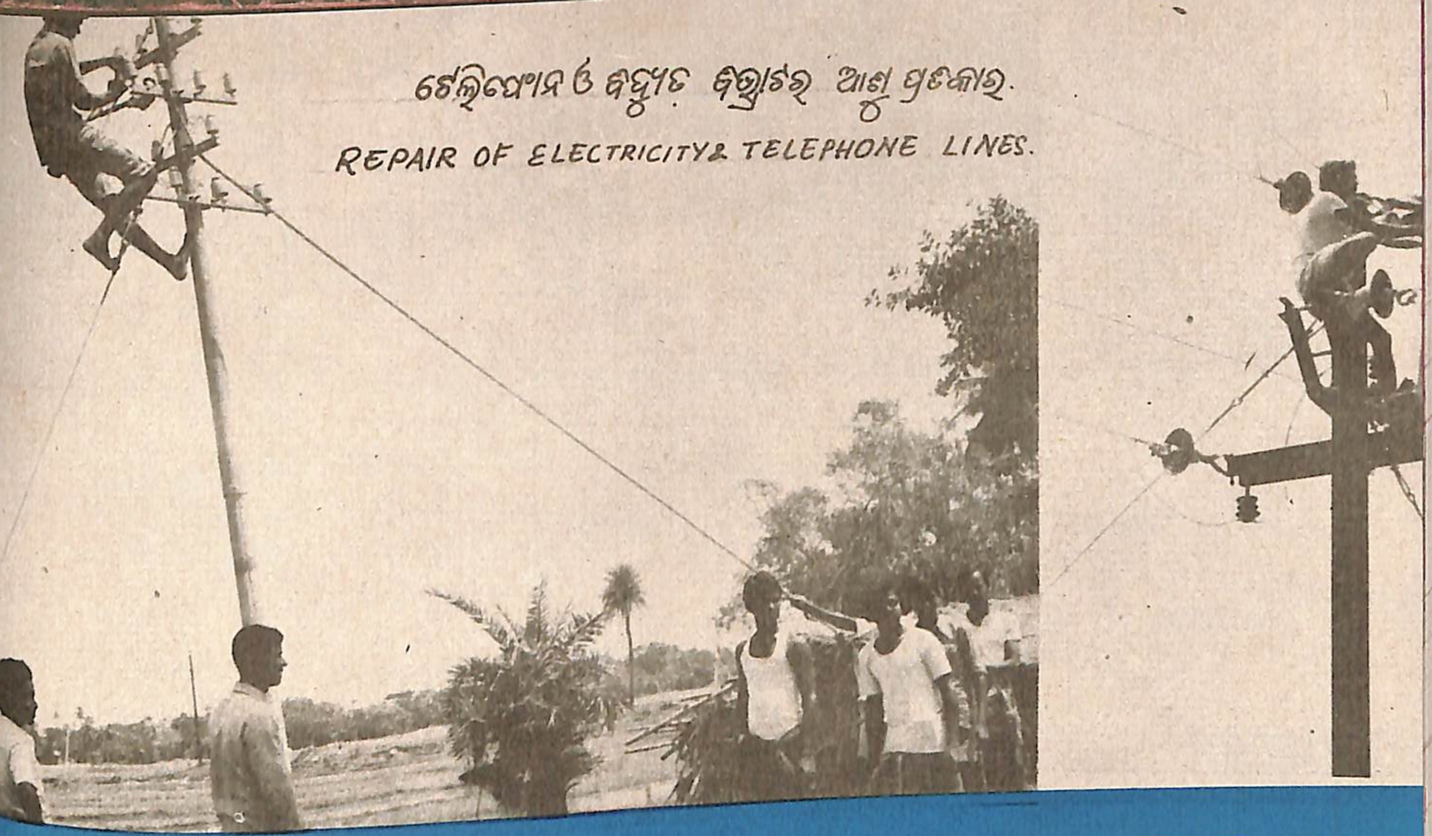
BANKI DEWATERED—...





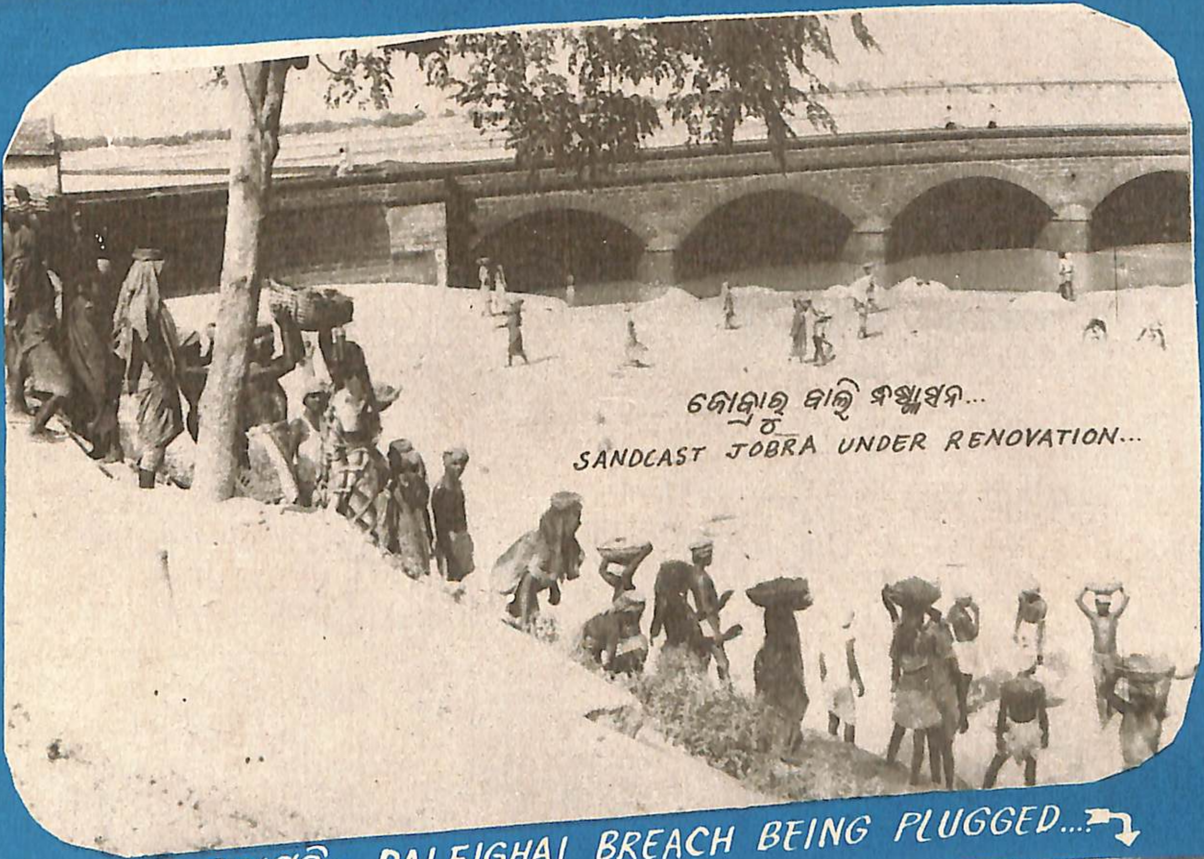
ସଂଯୋଗ ପାଇଁ ବିକଳ୍ପ ବ୍ୟବସ୍ଥା.... (କଟକ-ଭୁବନେଶ୍ୱର ରାସ୍ତ

RESTORING THE SNAPPED LINK....



ଟେଲିଫୋନ ଓ ବିଦ୍ୟୁତ ତାରର ଆଶୁ ପ୍ରତିକାର.

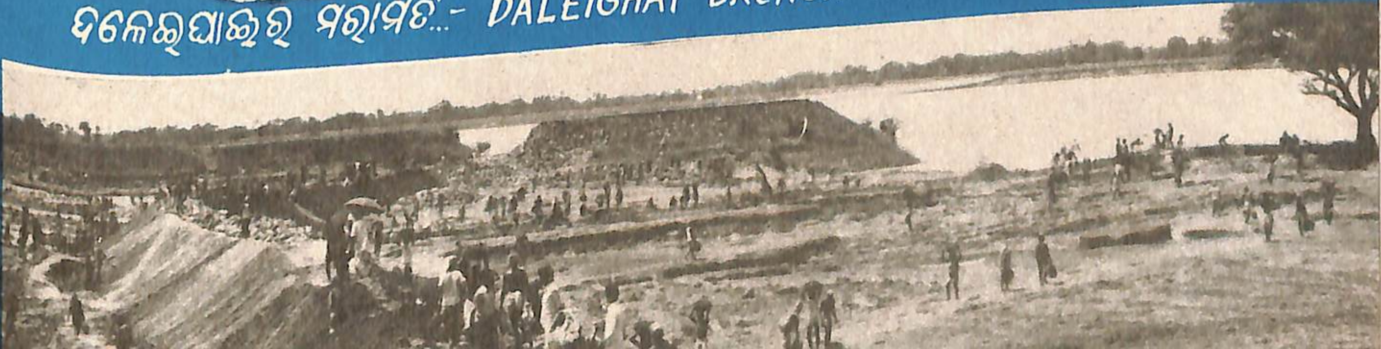
REPAIR OF ELECTRICITY & TELEPHONE LINES.

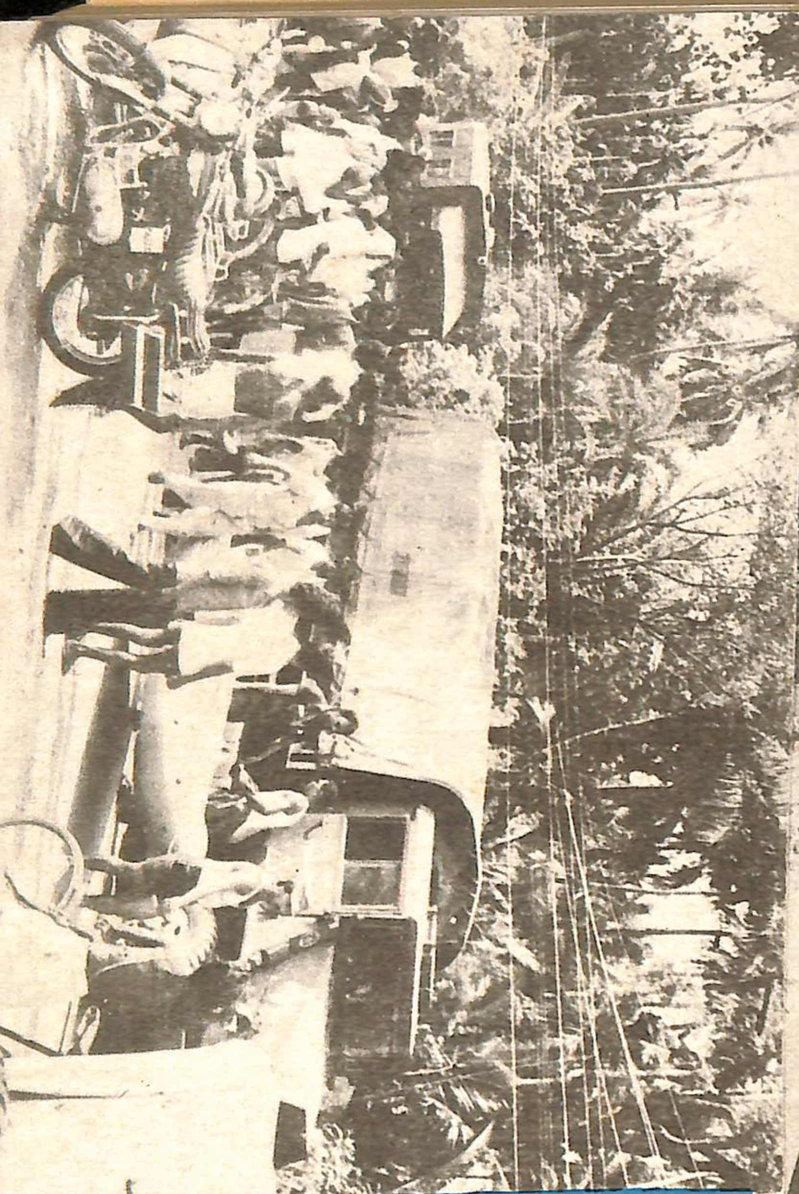


ଜୋବ୍ରାରୁ ବାଲି ନିଷ୍କାସନ...

SANDCAST JOBRA UNDER RENOVATION...

ଦଳେଇଘାଇର ମରାମତି...- DALEIGHAI BREACH BEING PLUGGED...





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ଉଦ୍ଧାର ବ୍ୟବସ୍ଥା

RINKING WATER, FOOD, & BOATS
N WAY TO FLOODED AREAS....

ଖାଦ୍ୟ ବ୍ୟବସ୍ଥା

↓

UTT ACK P. H. D. No.I

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ପାନୀୟ ଜଳ ବ୍ୟବସ୍ଥା

ଖାଦ୍ୟ ବଣ୍ଟନ

କିରେସିନ୍ ବଣ୍ଟନ...

ଟଲେଇ ବଣ୍ଟନ

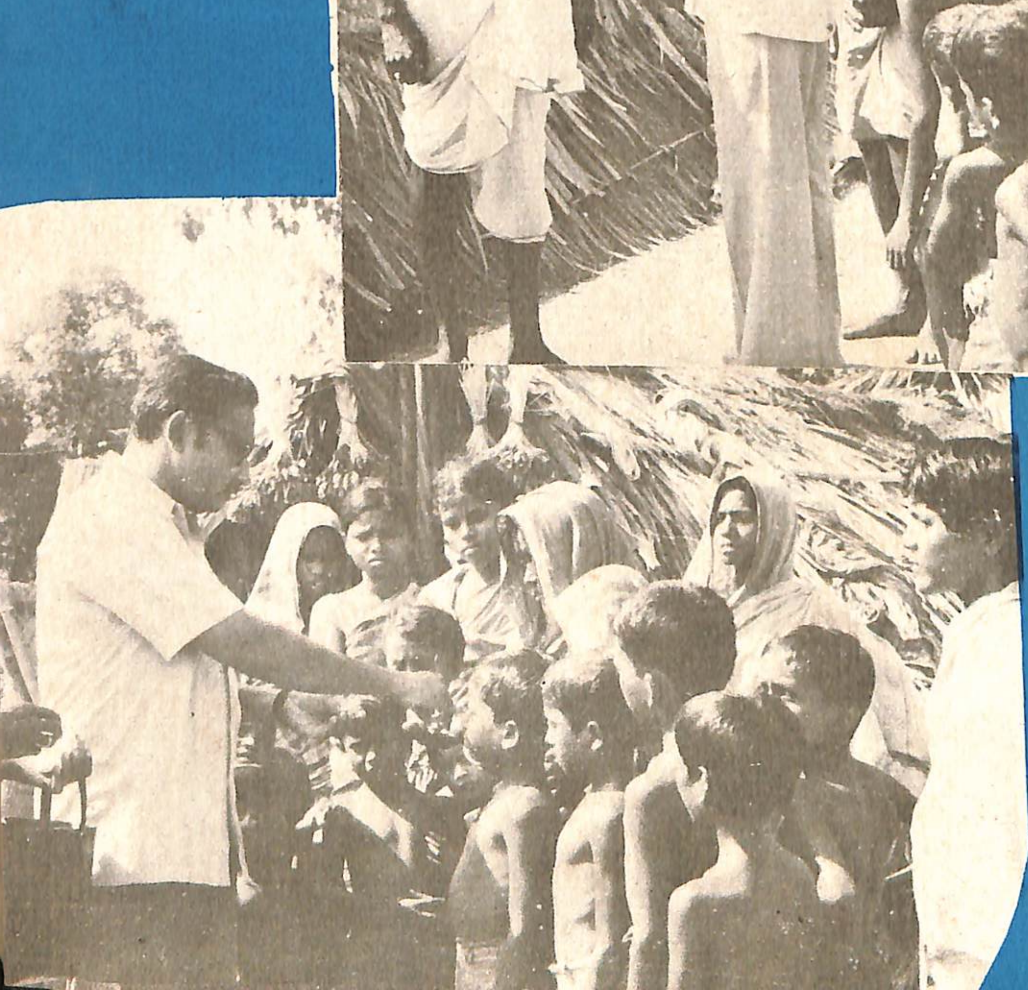
FOOD AND SHELTER

ଯୁଦ୍ଧକାଳୀନ ଭିତ୍ତିରେ
ସ୍ୱାସ୍ଥ୍ୟସେବା ବ୍ୟବସ୍ଥା...

Health measures
on War footing...

← ଜଳ ବିଶୋଧନ

ପ୍ରତିଷେଧକ →



← ଔଷଧ ବିତରଣ....

PRESS CONFERENCE - 30.8.82

ସାମ୍ବାଦିକ ସମ୍ମିଳନୀ - ୩୦।୮।୮୨

ଆଶ୍ରୟ ଶିବିର

MASS FEEDING

ସାମୂହିକ ଭୋଜନ

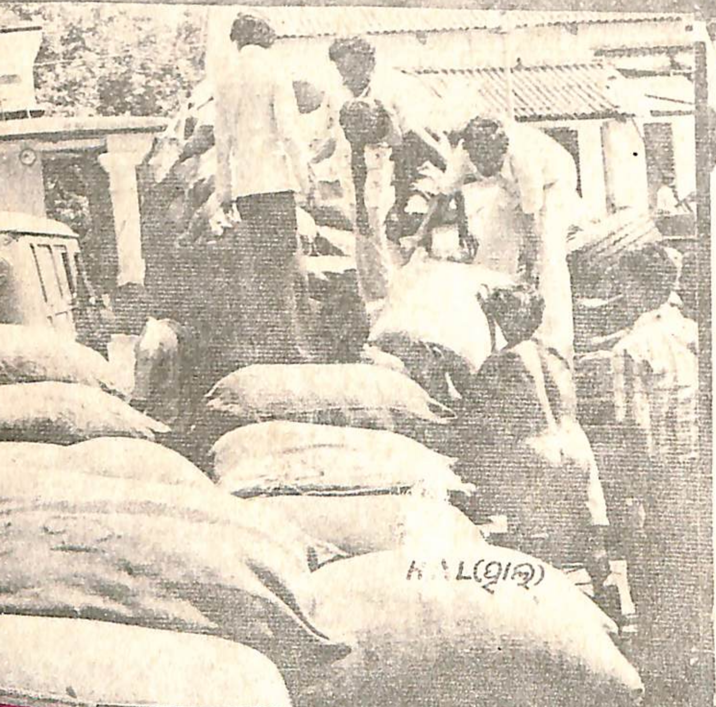
ଦୁର୍ଗତଙ୍କ ସେବାରେ "ସେବାସଂସ୍ଥା"

AID BY PHILANTHROPIC ORGANISATIONS

Youth Hostel Association....
ୟୁଥ୍ ହଷ୍ଟେଲ ଆସୋସିଏସନ୍

Red Cross
(ରେଡ୍‌କ୍ରସ୍)

ୟୁନିସେଫ୍ (UNICEF)

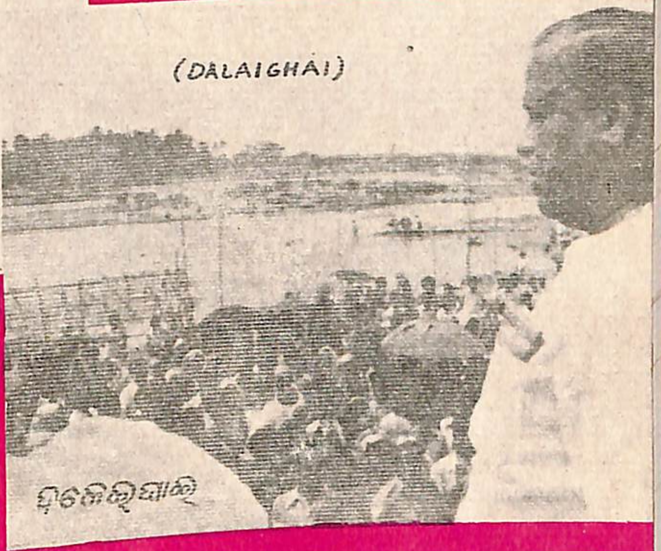


HAL(ହାଲ୍)

ସମାଜ ମଙ୍ଗଳ ବୋର୍ଡ
(Social walfare Board)

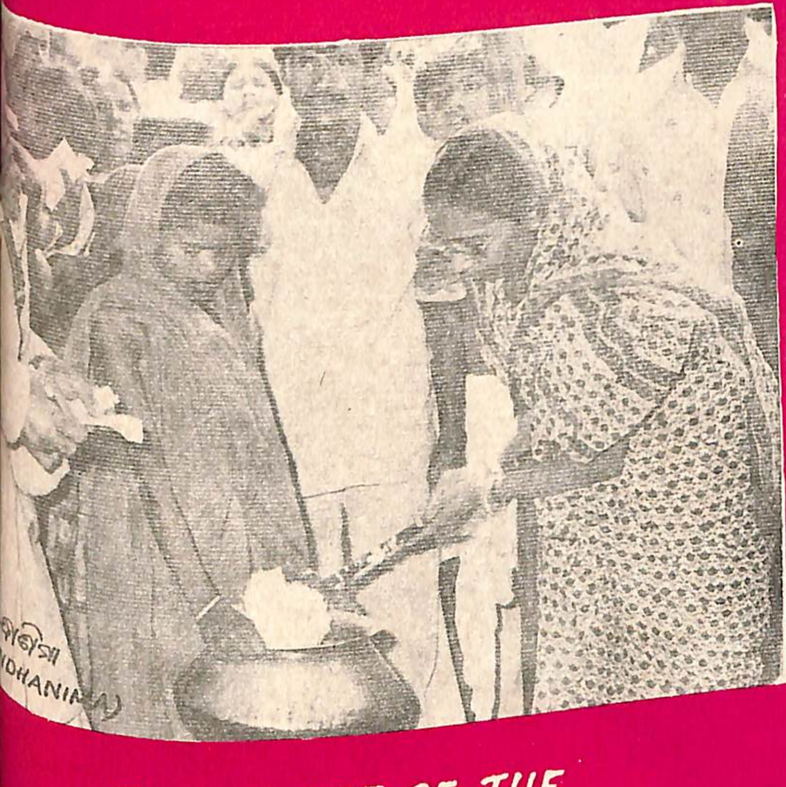
ବିପନ୍ନ ଭାଇ ଭଉଣୀଙ୍କ ପାଖରେ

ବିନ୍ଧାଣିମା
(BINDHANIMA)



(DALAIGHAI)

ଦଳେଇଘାଇ

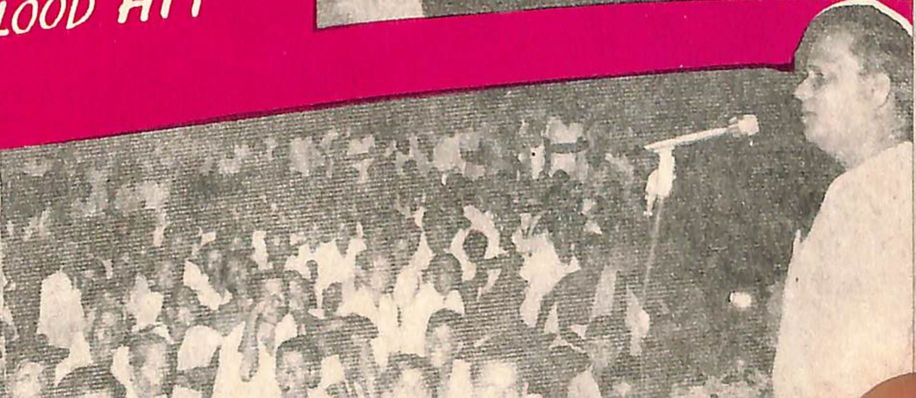


ାଣିମା
IDHANIMA)

AMANA
(ଅମନକୁଦ

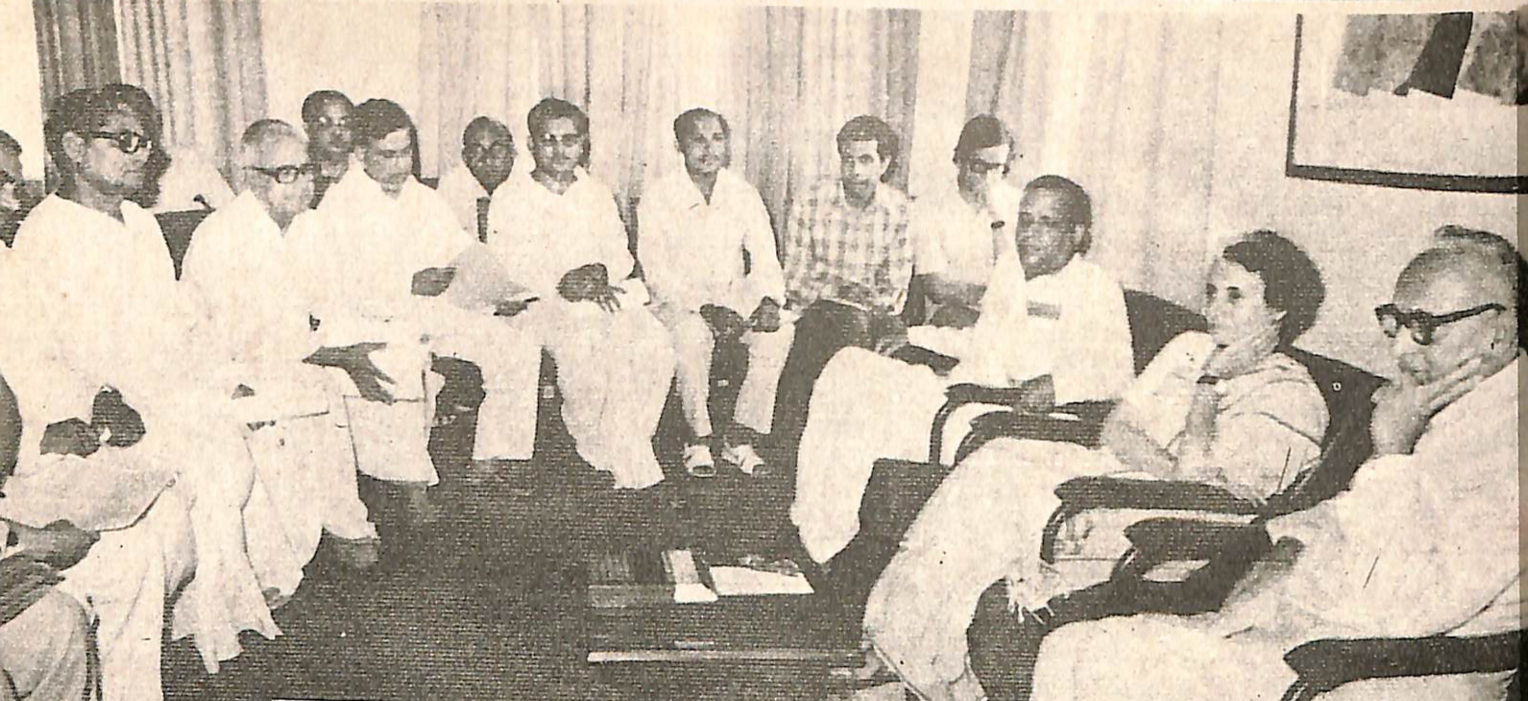
BY THE SIDE OF THE FLOOD HIT

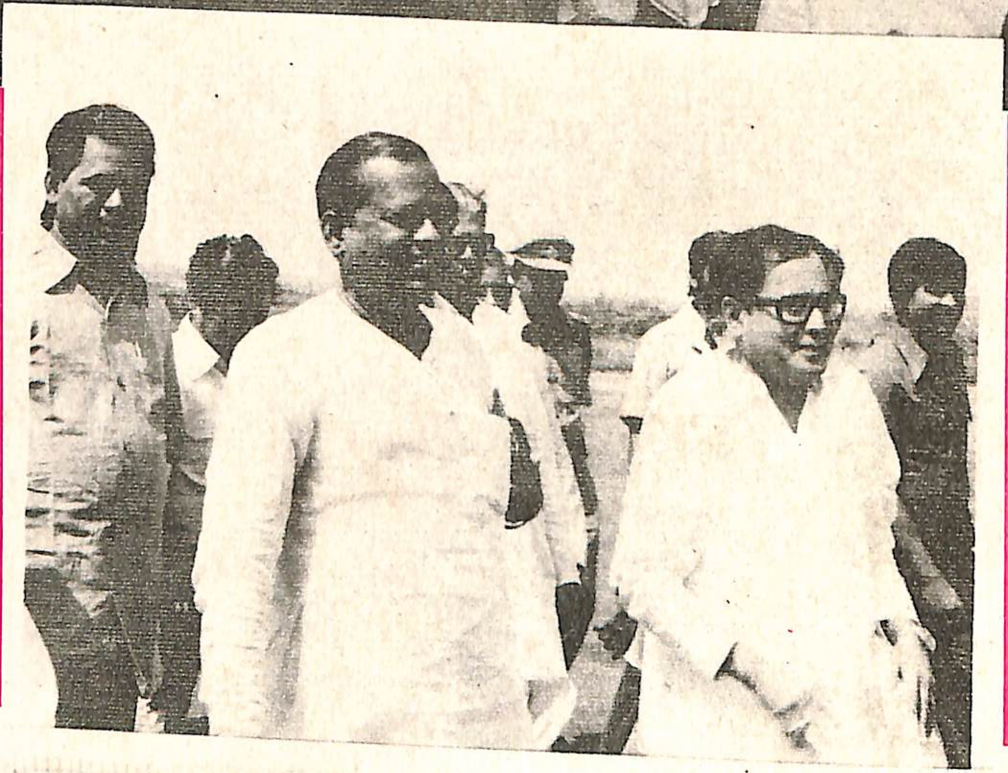
BHANPUR (ଭାଣପୁର)



କ୍ଷୟକ୍ଷତି ସମୀକ୍ଷା

CENTRE APPRISED OF LOSSES





UNION FINANCE MINISTER
(କେନ୍ଦ୍ର ଅର୍ଥମନ୍ତ୍ରୀ)
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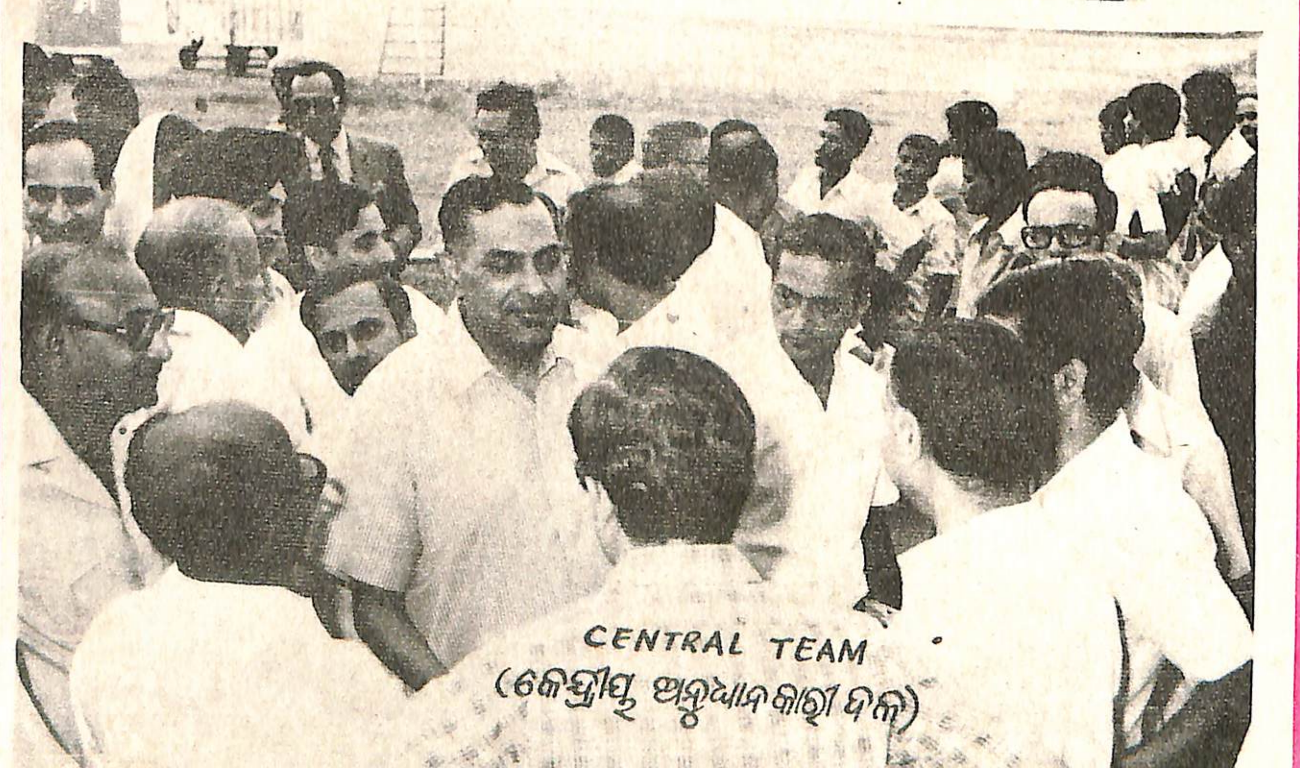
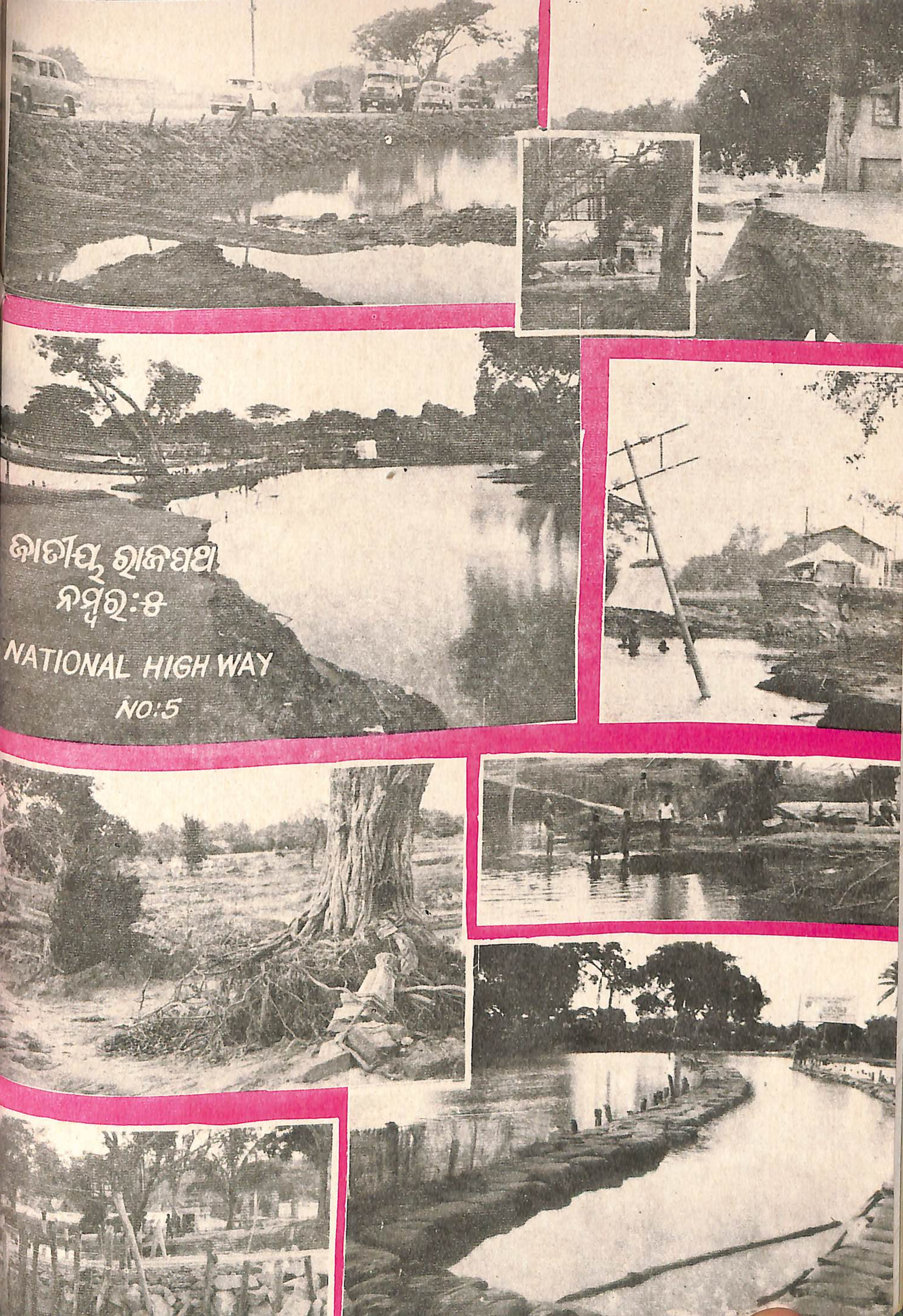
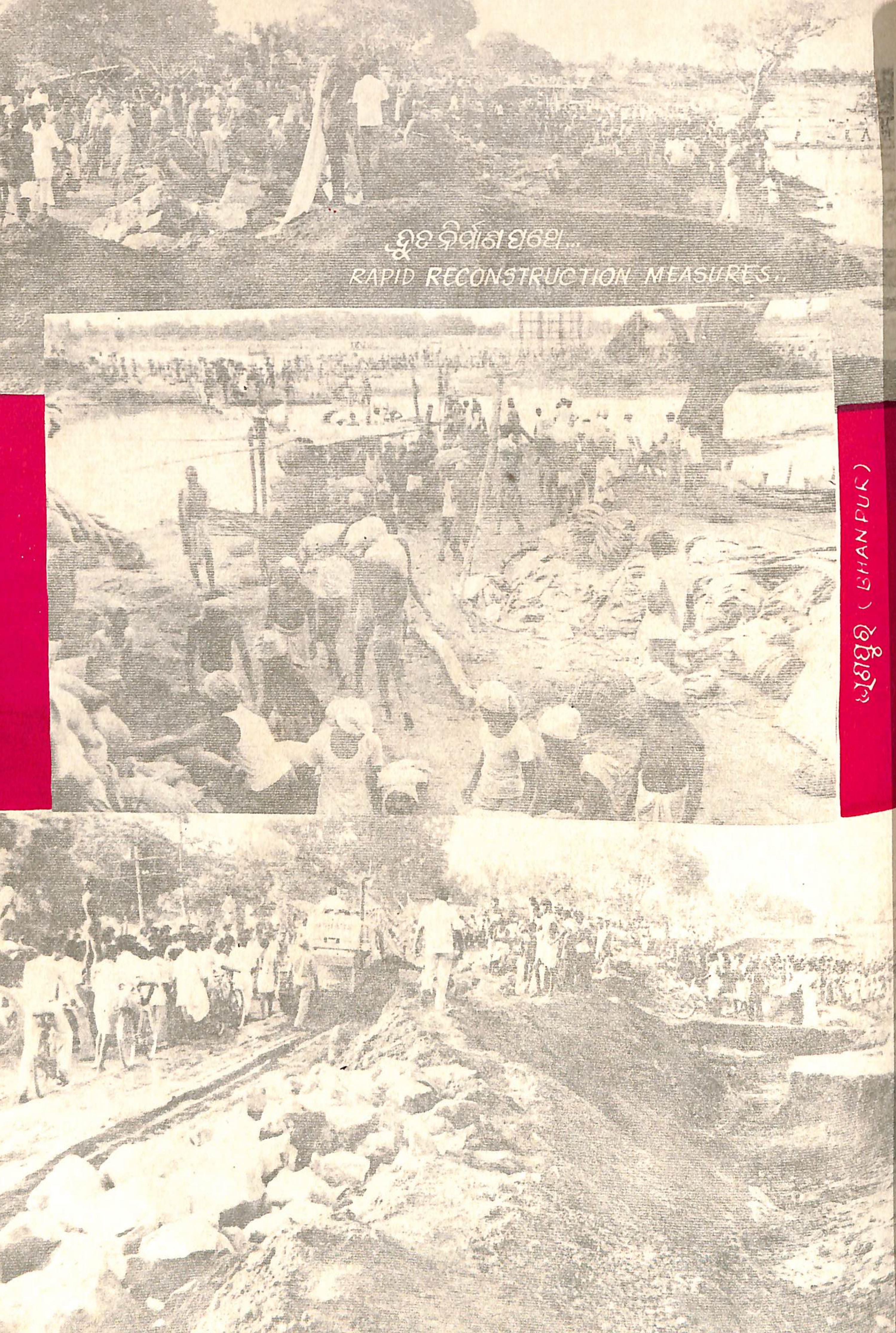


CENTRAL TEAM
(କେନ୍ଦ୍ରୀୟ ଅନୁଧ୍ୟାନକାରୀ ଦଳ)



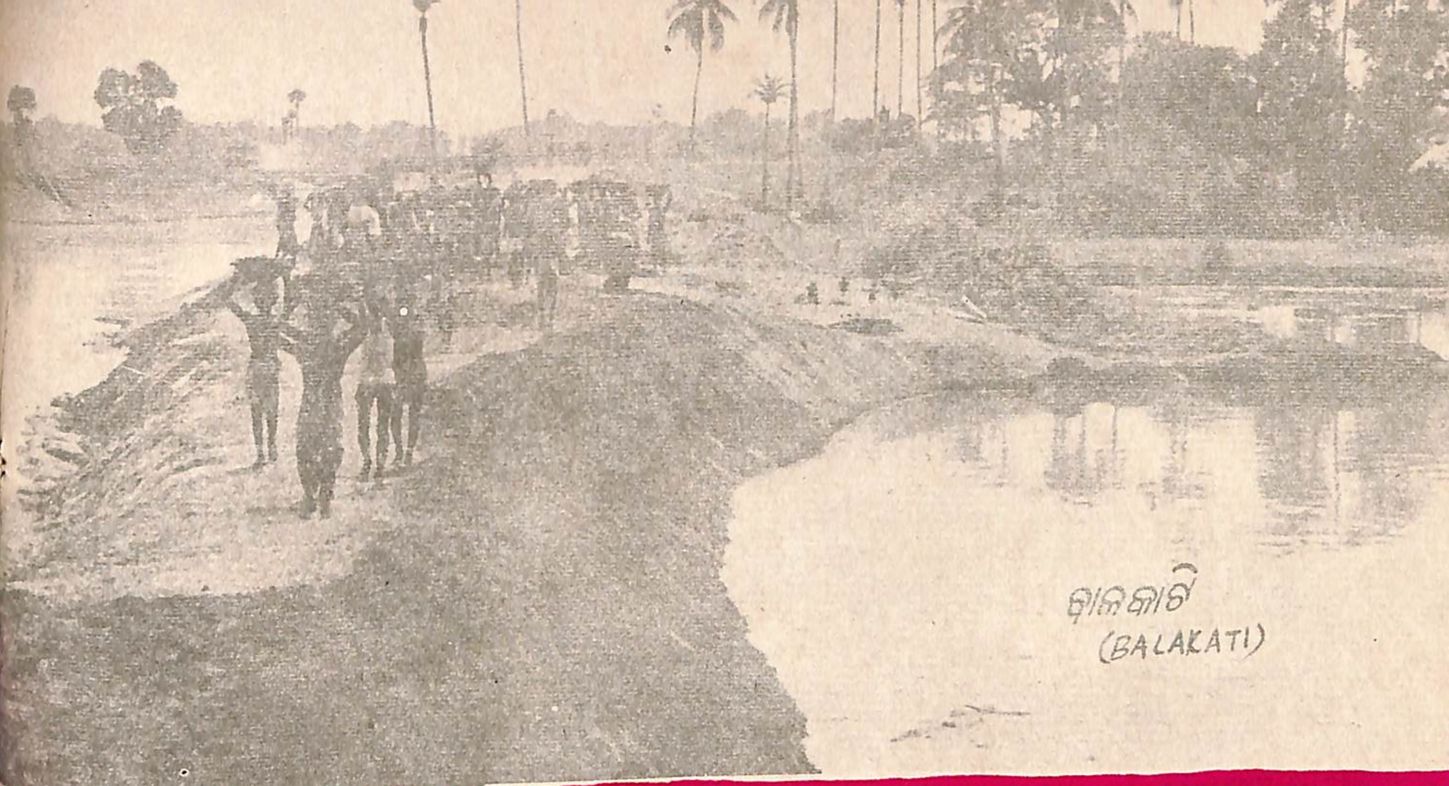
ଜାତୀୟ ରାଜପଥ
ନମ୍ବର:୫
NATIONAL HIGH WAY
NO:5



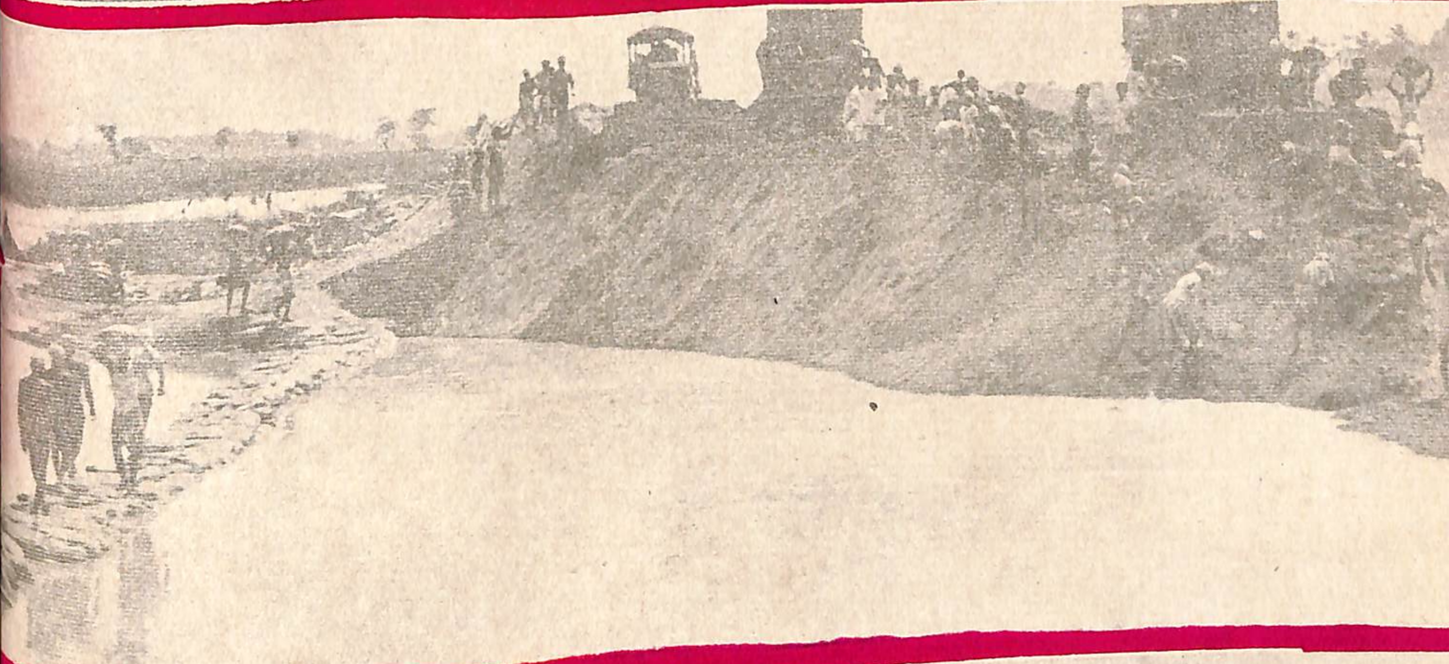
ଦ୍ରୁତ ନିର୍ମାଣ ପଥେ...

RAPID RECONSTRUCTION MEASURES...

ଭାନପୁର (BHANPUR)

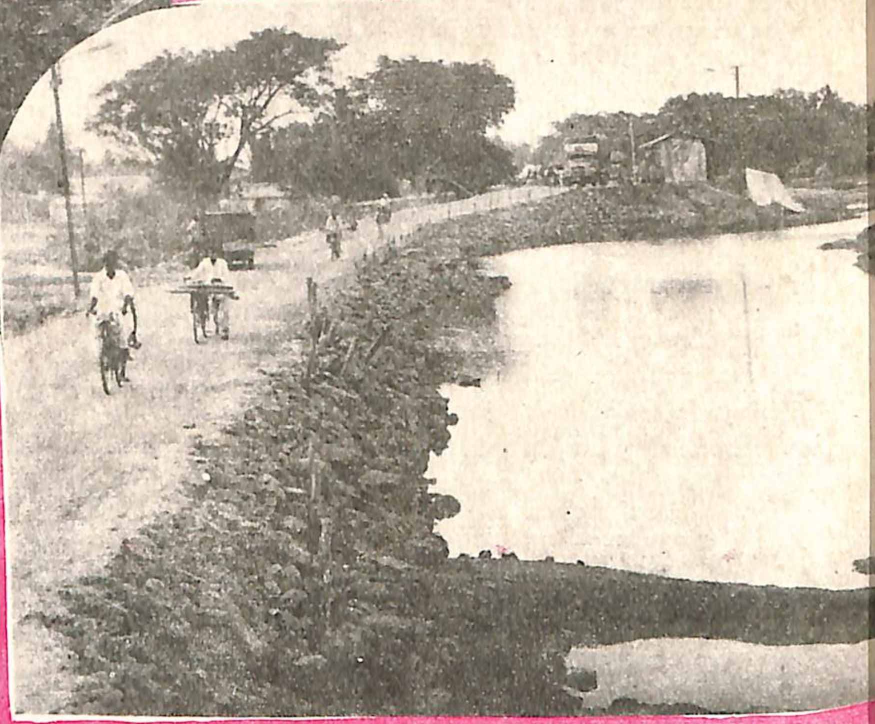


ବାଲକାଟି
(BALAKATI)



। କେନାଲ୍ ବନ୍ଧ ନିର୍ମାଣ...
EMBANKMENT RECONSTRUCTION...

ପୁନଃନିର୍ମାଣ ଦିଗରେ ଦ୍ରୁତ ପଦକ୍ଷେପ



RECONSTRUCTION - ON WAR FOOTING

Some Specialities of 1982 Flood in the River Mahanadi

Shri Artabandhu Jena

1982 monsoon started with a very unusual cyclone on June 3rd 1982 causing devastation to Cuttack, Puri, Balasore, Dhenkanal, Keonjhar, Mayurbhanj and Sambalpur districts with rainfall of 50 to 279 mm. and with maximum wind speed up to 220 Km. per hour.

This was followed by a severe drought. When all-out efforts were being made to combat the drought situation, then there was severe unprecedented rainfall of 582 mm. at Sambalpur on 18th August 1982 and 19th August 1982 (within 18 hours from 3-30 Pm. to 18th August). During this period, there was rainfall of 410 mm. at Hirakud, 312 mm. at Maneswar and 166 mm. at Jharsuguda. This caused breaches of embankment of Sambalpur town at Balibundh and canal system of Hirakud Dam Project and caused severe devastation in Sambalpur town and adjoining areas. The Power house of Hirakud Dam was submerged by rainwater which took more than 25 days for full restoration of generation of power. However, with closure of gates of Hirakud Dam, there was relief to Sambalpur town and Mahanadi basin downstream.

When the basin was surcharged with rain water, there was unprecedented rainfall in the entire Mahanadi basin downstream of Hirakud which caused to a flood of 15·8 lakh cusec at Naraj. The following table shows the maximum discharge at Naraj causing high floods in river Mahanadi. It indicates that 1982 has recorded the highest flood intensity in the living memory:—

		Lakh cusecs	
1982	..	15·84	
1926	..	14·20	
1929	..	14·40	
1933	..	13·90	
1937	..	13·50	
1939	..	12·04	
1940	..	13·70	
1955	..	12·40	(Vide Evaluation Report of Hirakud Dam Project).
1958	..	11·95	
1959	..	12·55	
1960	..	12·65	
1961	..	12·67	
1980	...	12·29	

The rainfall in Mahanadi basin below Hirakud Dam from 28th to 31st is given below:—

Name of Station	Rainfall in mm.			Total
	28-8-1982	29-8-1982	30-8-1982	
(1)	(2)	(3)	(4)	(5)
Hirakud	39·90	163·00	62·40	265·30
Bargarh	42·00	84·30	193·40	319·70
Barpalli	76·50	143·00	315·50	535·00
Dunguripalli	307·00	385·00	192·00	884·00
Bijepur	N.R.	140·00	531·00	671·00
Balangir	37·50	200·00	120·50	358·00
Titlagarh	28·00	121·50	115·20	264·70
Sonepur	..	220·00	338·00	558·00
Khairmal	77·20	245·00	84·50	406·70
Bhawanipatna	28·00	121·50	115·20	264·70
Narla	N.R.	213·00	124·00	337·00
Kaslamunda	N.R.	173·00	175·00	348·00
Madanpur-Rampur	N.R.	163·00	268·00	431·00
Kesinga	N.R.	190·00	207·00	397·00
Baranarasinghapur	N.R.	195·00	200·00	395·00
Phulbani	209·00	484·00	N.R	693·00
Pillasalki Dam	312·00	428·50	N.R.	740·50
Boudh	N.R.	123·00	269·00	392·00
Baliguda	3·30	180·00	221·25	404·55
Tikerpada	9·80	154·80	141·96	306·56
Barmul	13·20	299·30	57·26	369·76
Rajkishorenagar	N.R.	133·00	164·00	297·00

The records of gauge at Bellevue on Kathjuri left at Cuttack in 1982 is the highest recorded so far. Date of observation are given below :—

1892	27·80	
1911	27·80	
1920	26·75	
1925	26·00	
1926	27·35	
1929	25·70	
1933	27·35	
1937	28·25	
1939	26·25	
1940	26·60	
1946	26·83	
1947	26·25	
1955	27·00	Which caused breach at Daleighai.
1980	26·00	Which occured at 20·00 hrs.
1982	28·75	of 31-8-1982.

The gauge data of Jobra Anicut on the upstream are given below for some high floods, which would show the gauge recorded in 1982, was highest.

1982	77·20 ft,
1955	76·20 ft.
1933	75·55 ft.
1892	75·78 ft,
1872	75·95 ft.

For the first time in the history of Orissa, important towns, like, Sambalpur, Sonepur, Boudh, Athamallik on the upper zone of Mahanadi in the upstream of Delta got inundated and heavily damaged by flood and people residing in these towns experienced ravages of flood for the first time. The western part of Orissa, which generally, causes flood in the eastern part got fury of flood before the latter got devastated.

The contribution of run off of Mahanadi basin downstream of Hirakud was the highest ever recorded. The important bridges on rivers like, Ong, Suktel, Brutang, etc. got submerged. Due to such heavy contribution of flood, Mahanadi water could not get space for valley storage to reduce peak flood at Barmul before it reached delta head at Naraj. In this connection it may be mantioned that during high flood of 1982 the maximum flood observed at Barmul was 15·71 lakh cusec. on 31-8-1982 at 0·00 hours, while maximum flood observed at Naraj was 15·84 lakh cusec on 31-8-1982 at 17·00 hours. Hirakud Dam did not contribute anything for this flood, as all sluice gates remained closed from 16·00 hours of 29-8-1982. Had there been no dam at Hirakud, peak flood at Naraj would have gone up to 17·14 lakh cusecs which would have probably washed away the most populous Cuttack City of Orissa.

Town of Banki sustained loss to a large extent due to a breach at Charchika, while Cuttack, the premier city of Orissa was narrowly saved due to timely action taken to stop overflow, piping and heavy seepage by use of sand bags and due to breaches at downstream of the city.

Three historic rivers such as Prachi, Alaka and Renuka, which were silted up hundreds of years back, opened up.

The number of breaches in canals and river embankments in Mahanadi basin is innumerable (more than 20,000 Nos., out of which 265 breaches in river embankments have length more than 200 feet) inspite of all precautions taken for flood-fighting. This has severely affected the irrigation system of entire Mahanadi Delta, covering an area of about eight lakh acres. Besides irrigation system of Hirakud Dam Projects and of medium projects such as Salki, Daha, Uttei, Kuanria, etc., and many minor irrigation projects have been severely damaged.

Due to breaches in National Highway between Cuttack and Bhubaneswar (Capital of Orissa) and due to absence of a loop line joining these two cities, thousands of trucks and other vehicles were stranded for more than 15 days. This has necessitated construction of a bridge over Mahanadi at Munduli and connecting link roads joining

National Highway No. 5. In these breaches, it may be considered to provide culverts or vented causeway to take care of such flood situation.

The flood of 1982 August-September is the highest in the living memory and has remtnded us of our miscalculation for not constructing another dam on Mahanadi below Hirakud to control flood and diverting water for irrigation and generation of power, although three dams were conceived in 1945 for the same purpose over the river Mahanadi. However, the investigation of a multipurpose river valley project at Manibhadra in the district of Puri has now been taken up which will not only provide flood control to Mahanadi Delta, Khandapara, Nayagad, Banki, Narasinghpur, Badamba, Athagarh, etc., but also will generate 2,300 million units of Hydropower annually and will provide irrigation to 8 lakh acres of land in Cuttack, Puri and Ganjam districts.

This flood has also given us a lesson to strengthen protection works of Cuttack city and improvement of drainage problems of Cuttack for which Master Plans have been prepared at an estimated cost of Rs. 12·55 crores and Rs. 19·5 crores respectively. Similarly, town protection work of Banki has to be improved after filling up the breaches with proper quality control and the town has to be properly planned and reconstructed. Some double storied buildings are to be constructed in flood affected areas, which will function as an educational institution or community centre and will provide shelter during high floods. Telecommunication system in Irrigation Department should be improved, by providing V. H. F. sets at important points of river valley basins for better flood forecasting.

Last but not the least, we are not to lose courage at this period of national calamity and remember how Germans and Japanese rebuilt their country within a decade after full devastation by 2nd World War. We are to be determined to rebuilt Orissa with full vigour although we have sustained tremendous heavy loss besides valuable human life.

This reminds us the poem composed by the English Poet Sir H. W. Longfellow :

> "Lives of great men still remind us
> We can make our lives sublime
> And departing, leave behind us
> foot-prints on the sands of time".

Chief Engineer,
Irrigation,
Bhubaneswar.

—×—

Supply of Drinking Water to Flood Victims

Shri R. M. Senapati

The heavy down pour on the 29th and 30th August. 1982 will be remembered by the people of Orissa for a long time to come for it created a new chapter in the history of floods in Orissa.

On these two days the catchment of Mahanadi below Hirakud Dam received unprecedented rain fall. The rain fall recorded on these two days taken together indicates that Phulbani received rain fall of 693 mm., Bijapur 671 mm., Balangir 223 mm., Sonepur 555 mm., Madanpur-Rampur 430 mm., Kesinga 397 mm., Narala 337 mm., Karlamunda 348 mm., and Rajkishorenagar 294 mm. The consequences have been disastrous. Different areas of the western districts otherwise not prone to floods were devastated. Even without any discharge from the Hirakud Dam Project, the river Mahanadi started rising from the 29th August, 1982 and on the 31st August created new record surpassing the previous high flood records of 1892, 1911, 1933 and 1955.

The entire delta turned into a vast sheet of turbulent water causing several breaches in roads and embankments. Even the National Highway breached disconnecting Cuttack and Bhubaneswar. The road to Puri was disrupted. Power supply system was damaged in most of the affected areas which remained cut off. People in thousands were marooned and their houses and cattle were washed away. During this period the catchment of Rushikulya also received heavy rainfall causing damages in Ganjam district.

On hearing of the impending danger the Department of Housing and Urban Development immediately reacted. The old saying "water water every where not a drop to drink" flashed in the mind of officers. To meet the situation, the field officers were immediately alerted and mobilised so that the flood victims do not suffer for want of pure drinking water.

On account of the high floods, 10 Urban and 21 Rural Water-supply installations in the districts of Cuttack, Puri, Sambalpur, Balangir, Phulbani, Kalahandi and Ganjam were badly damaged. It was apprehended that about 9,000 tube-wells in the affected districts have been badly damaged. Even water-supply to the Capital city was threatened due to damage of the Capital Water Works. The urgent task before the Public Health Engineers was to ensure supply of pure drinking water. To tackle the situation an action programme was immediately put into operations —

(1) To undertake repairs of the damaged water-supply installations both urban and rural.

(2) To repair and disinfect the damaged tube-wells where the flood water receded.

(3) To provide drinking water in scarcity pockets and to those in shelter camps.

  (*a*) Through tankers or by trucks mounted with G. I. tanks and

  (*b*) By installing new tube-wells wherever possible; and

(4) To mobilise men and materials from non-affected areas in order to complete the operation within the shortest possible time.

The Public Health Engineers went into operation very swiftly. But for the prompt action even the Capital city would not have been spared of the gruesome experience due to scarcity of drinking water as sand entered through rising main to the floculater and operation of the treatment plant was affected. Due to entry of flood water into pump house the Kuakhai Head Work also suffered damage. Partial supply of water could be ensured through immediate repairs of the Head Work. Normal water-supply was possible only after the operation for removal of sand was completed on 5th September. The Daya Head Work was affected on the 30th August 1982 due to submersion of the pump house. Alternative arrangement was made through installation of temporary electric pump sets at Gongua till the Daya Head Work could be repaired and commissioned on 2nd September 1982.

Of the remaining 30 Water Works (9 Urban and 21 Rural) 17 were commissioned between 2nd to 9th September, 1982. These are water-supply systems in Cuttack, Charbatia, Kalahandi, Sambalpur, Bargarh, Balangir, Phulbani, Boudh, Bhawanipatna, Baramba, Kanpur, Kantilo, Samagara, Balanga, Padmapur, Tikaballi and Phulbani (Science College).

Another 8 water-supply systems were restored during the period from 10th to 16th September, 1982. These are the Rural Piped Water-supply Schemes at Banki, Dhauli, Bheden, Tora, Kantamal, Patnagarh, Tarva and Tusura. In case of the Water-supply systems at Salebhata, Mendha, Belpara, Saintala and Agalpur all in Balangir district, water-supply will be resumed soon after power is restored.

Repairs of tube-wells

Large number of tube-wells were damaged. As the flood water receded repairs and disinfection of those tube-wells was undertaken without the least possible delay.

The datewise progress of repair and restoration of tube-wells is as follows:

Number of tube-wells repaired in different districts

Date (1)	Cuttack (2)	Puri (3)	Balangir (4)	Dhenkanal (5)	Phulbani-Boudh (6)	Total (7)
4-9-1982	114	25	..	..	77	216
7-9-1982	421	205	..	..	..	626
8-9-1982	1,428	60	..	..	203	1,691
11-9-1982	1,684	331	..	..	29	2,044
13-9-1982	886	1,079	75	..	..	2,040
16-9-1982	295	550	73	22	151	1,091
Total	4,828	2,250	148	22	460	7,708

All these tube-wells were disinfected with Halogen Tabs. supplied by the Director of Health Services, Orissa. Repair work of the remaining tube-wells is still in progress.

Provision of water at shelter camps

As the tube-wells and other traditional sources of drinking water,viz., tank and open wells were polluted by flood water it was necessary to sink new tube-wells wherever possible to provide safe drinking water to the affected people. Till 18th of September, 111 new tube-wells have been installed in different shelter camps and scarcity pockets in the districts of Sambalpur, Puri and Cuttack.

In accessible areas drinking water was supplied through tankers and trucks mounted with G. I. tanks. Water-supply through tankers and trucks was made in the following places.

Puri District

Dhauli, Patia, Balianta, Daya, Nayahat, Kanas, Delang, Pipili area, Valpur.

Cuttack District

Banki town, Express Highway near Kendrapara, Jagatsinghpur, Biridi area near Kaijanga, Rahama, Manijangha, Pratapnagari, Gopalpur, Cuttack-Paradeep Road near Godama.

Sambalpur District

Scarcity pocket of Sambalpur town

Balangir District

Balangir town (affected areas of the town).

On the basis of experience gained during the current floods a fresh contingency plan is being drawn to meet such situation more effectively.

Secretary, Housing and Urban Development,
Secretariat, Bhubaneswar.

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ଛବିଶ ବର୍ଷର ଉମା, ଛଅଟି ସନ୍ତାନ,
ଦିବାରାତ୍ରି କୋଳାହଳେ ଶୋଷୁଥାନ୍ତି ପ୍ରାଣ ।

କୋଟରେ ପଶିଛି ନେତ୍ର, ପାଣ୍ଡୁର ବଦନ,
ଶୀର୍ଣ୍ଣକାୟ, ରକ୍ତହୀନ, ଶିଥିଳ ଚରଣ ।

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ଛଅଟି ଆତ୍ମଜ ରକ୍ତ, ମାଂସ ଯାନ୍ତି ଶୋଷି,
କାହାକୁ ଜଗତେ ଦିନେ ନ କରେ ସେ ଦୋଷୀ ।

କୁକ୍କୁଟ ଶାବକ ସମ ରହିଥାନ୍ତି ଘେରି,
ଆଜୀବନ ବନ୍ଦୀ ପଦେ ସେବା ଲୁହା ବେଡ଼ି ।

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ଏହି ସେହି ଉମା : ବିଗତ ଦଶଟି ବରଷ,
ଶିକ୍ଷା, ରୂପେ, ଗୁଣେ ଯେବା ଥିଲା ଆଦରଶ ;

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ଏହି ସେ ଚଞ୍ଚଳା ଉମା : ଯା' ନୟନ ଭଙ୍ଗୀ,
ଚାହିଁ ମୁଗ୍ଧ ହେଉଥିଲା କାନନ କୁରଙ୍ଗୀ ।

ପ୍ରାଣ ଭରା ହାସ୍ୟୋଲ୍ଲାସ୍ୟେ ତା' ଗତି ଛଟକେ,
ଲେଖନୀ ମୁନରେ କାବ୍ୟ କବିତା ଅଟକେ :

* * * *

ଏହି ସେହି ଉମା : ସେହି ସ୍ୱପ୍ନ ମାୟାବିନୀ,
ଆଜି ପ୍ରେତପୁର ଛାୟା, ଅଥବା ଡାକିନୀ :

ସବୁଜ କବି ବୈକୁଣ୍ଠନାଥ ପଟ୍ଟନାୟକ (ରଚନାକାଳ—୧୯୪୧)

ଚାଳିଶ ବର୍ଷ ତଳେ ରଚିତ ଏଇ କବିତାଟିରେ କବି ବୈକୁଣ୍ଠନାଥ ନାରୀର ଏ ଯେଉଁ ଦୟନୀୟ ଜୀବନଚିତ୍ର ଦେଇଛନ୍ତି, ଆଜି ମଧ୍ୟ ସମାଜରେ ପ୍ରାୟ ସେଇ ଅବସ୍ଥା ଲାଗି ରହିଛି । ଅଳ୍ପ ବୟସରେ ବିବାହ କରି ବହୁ ସନ୍ତାନର ଜନନୀ ହୋଇ ଆମ ଗାଁ ଗହଳର ଘରେ ଘରେ କେତେ ଯେ 'ଉମା' ଆଜି ରୋଗ, ଦୁଃଖ, ଜଞ୍ଜାଳ ଓ ଯନ୍ତ୍ରଣାରେ ସଢୁଛନ୍ତି, ତା'ର କଳନା ନାହିଁ । କେତେ ରୂପ, କେତେ ଲାବଣ୍ୟ ଓ କେତେ ଆଦର୍ଶ ଆଜି ଅକାଳରେ ମଉଳି ଯାଉଛି । ଏଥିପାଇଁ ଦାୟୀ କିଏ ଜାଣନ୍ତି ?

—ମୁଁ, ଆପଣ, ସେମାନେ, ଆମେ ସମସ୍ତେ ଓ 'ଏଇ ସମାଜ' ।

ନାରୀ ଜାତିକୁ ଏଇ ଦୁଃଖ, ନିର୍ଯାତନା ଓ ବନ୍ଧନରୁ ମୁକ୍ତ କରି ଏକ ସୁସ୍ଥ ସମାଜ ଗଠନ କରିବାର ଦାୟିତ୍ୱ ଆମ ସମସ୍ତଙ୍କର ।

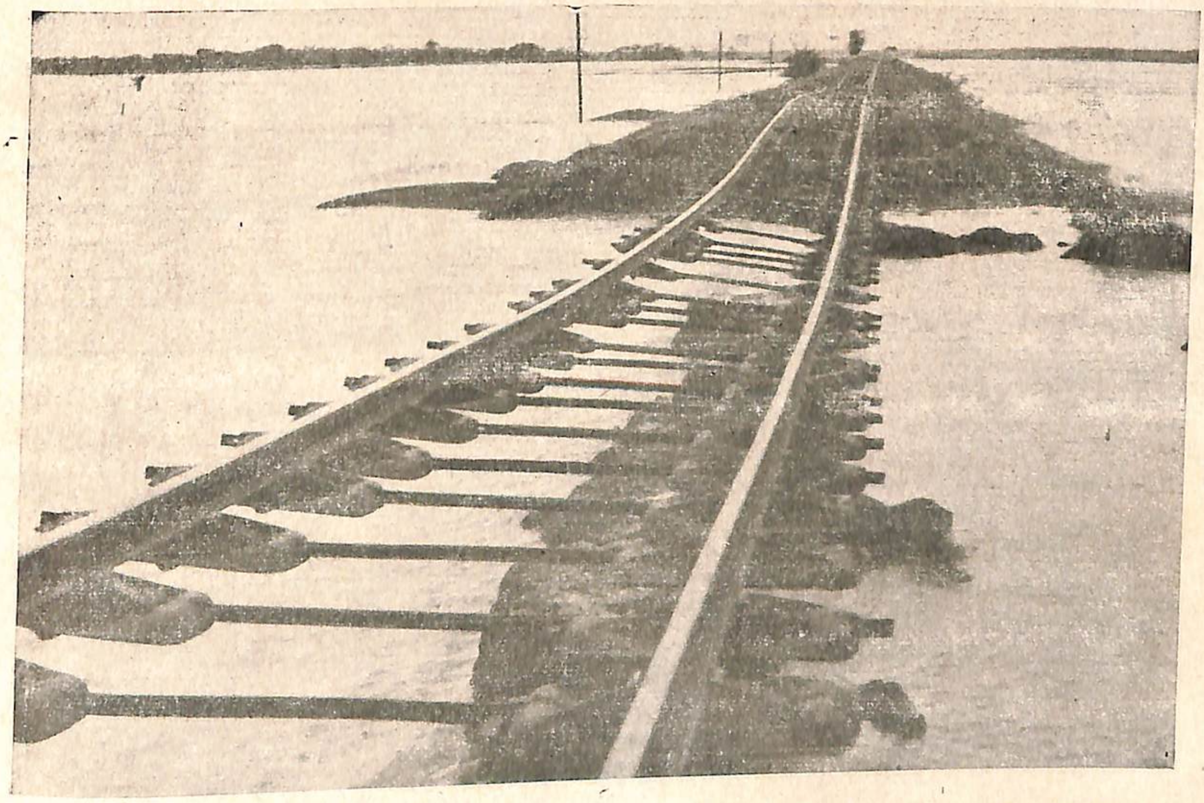
* ଚାଲନ୍ତୁ ଆଜିଠାରୁ ଏ ଦିଗରେ ଉଦ୍ୟମ ଆରମ୍ଭ କରିବା ।

ପରିବାର କଲ୍ୟାଣ ନିର୍ଦ୍ଦେଶାଳୟ
ଭୁବନେଶ୍ୱର

Railways and the Floods, 1982

Shri Satakadi Hota

The unprecedented flood, worst in the living memory, which occurred on the 29th and 30th August 1982 and 1st and 2nd September 1982 caused extensive damages to life and property in 8 districts. i. e., Cuttack, Puri, Phulbani, Ganjam, Dhenkanal, Balangir, Kalahandi and Sambalpur. The devastation has extended over an area of 90,000 Sq. miles and affected a population of more than 5 millions. For the first time road communication system was disrupted between Bhubaneswar and Cuttack and Bhubaneswar and Puri, and the Capital was cut off by road on both sides. However, through the Railway system withstood the severity of the flood, it has sustained heavy damages on Cuttack-Paradeep Section where railway track for a length of about 40 Kms. between Kandarpur and Rahama was severely damaged. The severe flood in western districts which affected Balangir and Kalahandi also affected the railway track due to breaches on the river Aung. The through-railway communication remained disrupted for 2 day both on the western and eastern sectors but was quickly restored by carrying out necessary repairs.



condition of the Rly. track on Cuttack-Paradeep section which was affected by the recent flood in Orissa

For 3 days water level on the railway embankments in Mahanadi (at Naraj), Kuakhai (at Cuttack), Bhargabi (on Puri branch line) topped the danger level and the velocity of water threatened embankments on both sides and thousands of people of the nearby villages took shelter on the Railway track, particularly between Cuttack and Barag, Cuttack and Gorakhanath for days before they could be rescued. The approach banks behind the abutments of Bridge No. 19 on Naraj-Ghantikhal Section and Bridge No. 553 (Kathjori) on the main line between Cuttack-Barang were eroded and traffic had to be suspended for some hours. Thereafter the road had to be repaired by Engineers on war footing at very short time to restore through communication.

As a result of the flood and consequence to the breaches of the Dalaighai, a large area in Cuttack district east on the railway line in Jagatsinghpur and Paradeep Sub-division remained submerged by river water. The bridges of river embankments and canal embankments breached due to heavy current of flood water and also a large number of houses in villages were affected. The railway track was thrown away from its bank by about 3 to 4 metres and was hanging like a thread at many places. The track was also twisted badly. The formation was washed away completely. The Stations, Badakhandeita and Gorakhanath, remained inaccessable for several days and the marooned staff had to take shelter at the top of houses and had to be rescued.

While damages on the Sambalpur-Balangir line could be repaired quickly, the damages on the Cuttack-Paradeep line was so extensive that it could need about 40,000 Cum. of cinder and 10,000 Rum. of boulders for initial restoration. This is equal to about 3,100 wagons-load of cinder and boulders which had to be rushed from adjoining railway divisions on top priority basis to Cuttack-Paradeep Section. The work was carried out day and night under the supervision of an Additional Chief Engineer assisted by several other Field Officers and staff. 1,000 labourers worked for restoration continuously for over 6 weeks. The volume of work could be imagined when the requirement of final restoration is taken into consideration. After putting cinder and boulder of the above quantity, the final restoration would require 2,50,000 Cum. of earth work, 5 Kms. of re-sleepering of track with new sleepers, 16,000 Cum. of bellasting, etc.

The telephone, telegraph and electric lines were damaged very severely at many places and therefore, communication system remained suspended. Many polls were up-rooted and wires snapped at many places. The communication system was disrupted for several days. It is estimated that Rs. 2 crores would be needed for restoration of the railway track. The indirect losses would be much more as the traffic to Paradeep Port remained suspended over six weeks.

Commissioner, Railway Co-ordination-*cum*-
Special Secretary to Government,
Transport Department.

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How the Administration took up the Challenge

Prof. Rajkishore Ray

More than 10 million people spread over 90,000 square kilometres in 100 blocks in eight of the thirteen districts of Orissa have been severely affected by the current unprecedented floods, the like of which has no parallel in living memory.

The magnitude of the loss of life and damage to property was yet to be assessed now that communications in the affected areas have been restored and road links established.

The Mahanadi and its branches burst their banks at 113 points in Cuttack and Puri districts alone. Bolangir and Ganjam districts have also suffered in this regard.

Due to the unprecedented rainfall in the catchment of river Mahanadi downstream below Hirakud Dam on August 29 and 30, a peak flood of 15·80 lakh cusecs passed through the river causing extensive damages in Sambalpur, Bolangir, Kalahandi, Phulbani, Cuttack and Puri districts. It has been ascertained that there had been no discharge of water from the Hirakud reservoir. Had there been any release from the reservoir, the flood would have been much more serious causing destruction unimaginable.

A major calamity caused by the unprecedented flood has struck areas in Orissa leaving millions marooned. Of the State's 24 million population, nearly ten millions are affected.

The Chief Minister requisitioned the help of the Army and the Indian Air force on August 30 and within three hours the I. A. F. helicopters had started arriving in from the Kalaikunda base of Eastern Air Command. I. A. F. had placed five MI-8 and one Chetak helicopter at the disposal of the State Government and a task force was formed with Group Captain M. M. Lal as the base Commander.

Air Droppings

Air dropping of food packets and other essential commodities has continued in inaccessible pockets since the 31st August 1982. The details are as follows—

Date		No. of sorties	Total haulage in tonnes
31-8-1982	..	13	26·500
1-9-1982	..	19	35·776
2-9-1982	..	35	46 661
3-9-1982	..	36	72·425
4-9-1982	..	40	81·941
5-9-1982	..	21	57·010
6-9-1982	..	44	90·675
7-9-1982	..	40	107·175
8-9-1982	..	22	40·550
9-9-1982	..	1	0·400
10-9-1982	..	19	51·145
11-9-1982	..	4	9·200
Total	..	294	619·458

Air dropping of food packets and other essential commodities have since been discontinued with effect from the 12th September 1982.

Train Communications

The Cuttack-Paradip Rail Line has been very badly damaged and embankment has been washed away at many places. It is estimated that it would take more than one month to repair the damages. All trains including two local shuttles between Bhubaneswar and Cuttack and other passenger and Express trains except Assansole-Puri are running.

Relief Operations

Government relief was adequate. Relief was rushed to inaccessible parts but due to deep water-logging some areas were not accessible. The situation eased itself after a couple of days. On August 30, I. A. F. pilots made 16 sorties and dropped 25,000 Kgs. of food. On September 1, the helicopters made 24 sorties and dropped 48,000 Kgs. of relief food items. Till September 3, the Air Force had dropped nearly 1,60,000 Kgs. of load, in addition to lifting 55,000 Kgs. of relief materials and food supplies from Dum Dum by AN-128.

Loss of Life

Number of lives lost in recent floods in comparison with its tremendous fury and magnitude is probably less. However succour was provided to marooned people at short notice.

Balagandi Sahi
Puri

Restoration of water-supply

Urban water-supply scheme affected...	10
Resumed after temporary repairs ...	10
Rural pipe water-supply scheme affected.	21
Resumed after temporary repairs ..	14

Sinking of Tube-wells in shelter camps—

Sambalpur ..	27
Puri ..	56
Cuttack ..	2

Repair-restoration and disinfection of tube-wells.

District	Affected	Restored	Balance
Cuttack	4,900	4,828	72
Puri	2,500	1,700	800
Phulbani and Ganjam.	460	460	..
Bolangir	500	85	415
Dhenkanal	22	..	22

High Morale

Since the high and unprecedented flood was not man-made, as some people hold to be man-made, the people who suffered kept up high morals throughout and abandoning despair have come out for rehabilitation depending on the Governmental relief and facilities.

Nature's challenge has been taken up with courage and foresight of the Administration. Lapses there may be but those were unintentional.

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ROAD NETWORK CUT INTO PIECES

Shri Prahllad Patnaik

The current year 1982-83 has been ominously the most calamitious year for the State of Orissa. On 3rd and 4th June 1982 the worstever cyclonic storm hit the State and brought in almost paralysing moments mostly in the districts of Cuttack, Puri and Balasore. The monsoon broke out approximately in the middle part of June' 82 but then the pace of rainfall slowed down. Those state of affairs continued for such a long time that the State of Orissa was confronted with a severe drought condition. Believing this, the district of Sambalpur experienced the worstever flood situation due to unprecedented concentration of rainfall about 581·70 mm. within a short period of 18 hours on the 18th August 1982 and the 19th August 1982. The flood water of Mahanadi entered into the Sambalpur town, which was practically engulfed and created a catastrophic condition entailing loss of lives and properties. When the State was just recovering from this situation, came in quick succcession as ill luck would have it, the most unprecedented flood due to heavy concentration of rainfall between August 29th to 31st.

There were devastating floods in different rivers like Mahanadi and its tributary like Tel etc. at its upper reaches resulting in heavy flood in Kuakhai, Kathjodi, Birupa, Daya, Bhargabi. Luna and Chitrotpala etc. Notably the floods in rivers Mahanadi, Kuakhai, Daya and Bhargabi exceeded its previous records in the living memory and caused incalculable miseries.

The districts of Cuttack, Puri, Sambalpur, Balangir, Phulbani, Kalahandi, Dhenkanal and Ganjam were seriously affected. Banki area, particularly to Banki town in the district of Cuttack and Dalaighai area in Jagatsinghpur area and Kendrapara and Marshaghai, were seriously affected. In addition to the above, there were also floods in river Baitarani, Vansadhara due to which the districts of Balasore and Koraput were partially affected. Boudh area of Phulbani district was also equally affected.

Due to above flood situation the communication system of the State was seriously disrupted and road network was virtually cut into pieces due to breaches and submergence at several placas. Bridges. culverts, causeways were affected and some of them were washed out and in some cases approaches had breached causing severe dislocations. Miles of roads were under submergence for days together. The depth of flood water and the high velocity of flow stood as a baffling problem to have immediate restoration. It could only be possible after the water subsided.

A brief account of colossal damages to the communication system is given below:—

The State Highway No. 8 from Bhubaneswar to Puri was affected causing 4 breaches between the road leading to Dhauli Temple and Uttara junction. The traffic to Puri was disrupted, The roads connecting the Banki town from either side were disrupted and the Banki town was cut off to the outside world.

The road from Kandarpur to Jagatsinghpur was submerged under several feet of water due to breaching of Dalaighai and thereby traffic was dislocated to Jagatsinghpur, Cuttack. Paradeep road was submerged at many places for miles together including breaches and the traffic from Cuttack to Paradeep and intermediate places were disrupted.

The roads leading to Banki, Kendrapara, Marshaghai were submerged under several feet of water and there were breaches and the traffic was disrupted. The old Cuttack-Sambalpur road was submergad for its major portion was under several feet of water and the traffic was disrupted.

The Balangir-Sonepur road was disrupted due to breach in approach of Suktel Bridge. The Bargarh-Balangir road was disrupted with a breach at Suktel Bridge and another breach at bridge over Aung river for 300 ft. wide and 40 ft. deep. Boudh town was completely dislocated due to heavy breaches at its outskirt. The road from Boudh to Sonepur was breached and as a worst coincidence, there were breaches at 7 bridges between Boudh and Manamunda including washing out of the Talasarda minor bridge.

The above are only the brief account of heavy casualties that have taken place to the communication system.

The field people were kept on alert and immediate restoration was started as and where the water subsided by 9th September 1982 excepting a few places almost all the worst affected areas were restored. Amongst other notable are—

1. Cuttack-Kandarpur-Jagatsinghpur, Machhagaon road (Daleighai area).
2. Cuttack-Paradeep road
3. Cuttack - Kendrapara - Marsaghai road.
4. Bhubaneswar-Puri road
5. Nimapara-Astarang road
6. Simor-Banki road

As per report received so far, about 5,000 Km. of roads in toto out of the total length of about 14,000 Km. (maintained by Roads Wing), out of the above the 8 Nos. of districts, i.e. (Cuttack, Puri, Sambalpur, Balangir, Phulbani, Dhenkanal, Ganjam and Kalahandi) the total length comes to about 9,400 Kms. out of which about 4,300 Kms. were affected in various description, i. e., submergence, breaches, washing away of cross drainage works, damages to the roads surface etc.

The statement at Annexure 'A' and 'B' indicates the tentative assessment cost of immediate restoration and restoration to pre-flood condition. As per this the total cost of immediate restoration and cost of restoration to pre-flood condition is Rs. 43·44 crores. In addition to the above, it has been roughly estimated that an amount of Rs. 29·80 crores may be necessary to withstand such unprecedented flood condition as remedial measures.

DETAILS OF DAMAGES IN DISTRICTS

Bargarh-Balangir Road (S. H. 2)

Breach in approach of Aung bridge at 42nd Km. of State Highway No. 2 on 30th August 1982. The length of breach was about 300 ft. and depth 25 ft. The date of occurence is on 30th August 1982. There was another breach in approach of Suktel Bridge at 62nd Km. when flood came down, over 500 persons worked day and night from September 2, 1982 to plug the breach. Communication was finally restored on 15th September 1982. The river Suktel crosses Balangir-Sonepur road at 25th Km. Here also there was a breach in about 200 ft. length and 25 ft. depth. This was repaired and restored to traffic on the 16th September 1982. The damages to approach and wing wall for Chatia bridge on Maneswar-Kolapara road occurred on the 18th August 1982 due to heavy concentration of rainfall in Sambalpur Zone. This rainfall of the 18th August 1982 also caused breach to approach of Sansari Jore bridge on Sambalpur-Sonepur road State Highway. One breach in the approach of Ghes bridge on 17/0 Km. of S. H. 3 on Sohela-

Nuapada road was caused on the 30th August 1982. Communication was restored on the 16th September 1982.

Phulbani district

There has been wide spread damages to road, severe breaches in Boudh Sonepur road between Boudh Manamuda during the floods on the 30th/31th August. The approaches of Salki bridges along with a 10 ft. span culvert at 6 km. Talasarada bridge at 13 km. Gohira bridge at 14 km. and Bag bridge at 20 Km. and Mehrani Brldge at 26th km. were washed out causing very wide and deep breaches. The wing walls of bridge have been tilted and displaced. The approach slab are over hanging. The breaches have also baen caused in approaches of Boudh Town, Manamunda town and near village Marjodpur at 14th km. of this road restoration works were taken up day and night shifts engaging about 2,000 labourers and it has been possible to restore the road to light vehicies so far.

In Manamunda-Kantamal-Ghantapara road several causeways have been badly damaged along with its approaches such as Mankada Chuan causeway at 2/2 mile. Badjore causeway at 5th mile and Sanjore causeway at 6th mile. Traffic was restored on the 11th September 1982 on this road.

There has been big breaches on both sides of the approach of Pila-Salki bridge in outskrit of Phulbani town at 183rd km. on Berhampur-Phulbani road (S. H. I.) on 30th August 1982. Traffic was restored on the 2nd September 1982 after day and night work and engaging about 300 labourers. There was also a deep breach in left approach of Bada-Salki bridge at 190 km. of Phiraguda-Sarangada road. Traffic was restored by engaging 400 labourers. The railing of this bridge was also badly damaged by obstruction of floating trees. One 15 ft. R. C. C. culvert along with its approaches was washed out at 8th Km. of Khejuripada-Sankarkhole road (C. V. R.). Traffic on this was restored on the 19th September 1982.

There were land slides and collapse of retaining walls and damages to causeways road on 3rd km., 5th *k*m., 21st km. and 22nd km., 26th and 27th kms. The damages were severe in ghat portion at Vetkol Ghat and Ranipathar Ghat. The construction of retaining walls in ghat portion is a time taking affair.

On S. H. I. a minor bridge at Maradabada with its approach at 137 km. has been washed out exposing the foundation of structure.

There has been Hill slides on Gariapada Ghat on S. H. I. between Kharipada-Madabepur, causing severe damagas to ghat road. This road was open to traffic on the 7th September 1982. Over Madabepur causeway at 2nd Km. there was continuous flow over the causeway for 10 ft. depth for four days, causing complete damages to the approach road and vents and after subsidence of floods it caused heaping of sand upto a height of 1·25 meter for 50 meter length on either side of the causeway. On same S. H. an interesting feature is that in ghat road at 153 km. a monstrous stone af size 35′ × 30′ × 20′ slipped and blocked the road and it was a hard task to clear this.

Cuttack district

The flood in Cuttack district not only caused severe damages to the arterial roads disconnecting Cuttack to Jagatsinghpur, Cuttack to Kendrapara, Kendrapara to Marsaghai, Kendrapara to Chandbali, Cuttack to Paradeep but also cut off links between Subdivisional Headquartars and Panchayats by severe breaches and damages. Breach of Dalei Ghai damaged all the roads around Jagatsinghpur area and it took about 10 days to restore communication excepting restoring commnnication from Kandarpur to Jagatsingpur which was restored only on 16th September 1982. Tarikud Bazar was under 3 ft. water at 12 ft. km. of this road.

Inside Jagatsinghpur Town the approach roads to S. V. M. College was severed by breach of approaches to bridge over Alaka. There were breaches on Kendrapara, Machagaon road at 5th and 8th km. from Dalel Ghai breach. Machagaon Canai breach at Barada caused another breach damaging a stretch of Kandarpur-Machagaon road. Jagatsinghpur-Alipingal road was completely breached at several points at the approaches of the Alaka bridge at 2nd km. due to flood in Aiaka river. On Dhanipur-Kantilo road there were number of breaches. There was a breach at 1st km. of Biridihat-Sompur Road. Balibhaunri-Sikharghat road (M. D. R.) was under submergence for 4′ depth of water by floods of Alaka river causing heavy breaches in 6 km. and 9th km. and 10 km. and 12th km. Balikuda-Nuagaon road was severely damaged and was under 5′ water and the Tahasil Office was half submerged.

On Manijanga and Arasama road there were 2 breaches in the 1st km. and two breaches in 6th km. and another breach at 8th km.

On Rahama-Pandua road there were 2 breaches in 4th km. on old Cuttack-Puri road in the 1st km. there were 2 breaches. There were 3 breaches on Phulnakhara-Niali Madhab which was restored on 9th September 1982. There were bad breaches on approaches of Kaliaghai bridge on the same road. There was breach at Olatapur approach road. There was a big breach on Sunaghai on Salei-Baharana road at 2nd km.

Heavy breaches were caused at 12 km. and 13 km. of Barua-Balichandrapur road. There was breaches at 3rd, 6th, 7th, 8th, 9th and 10th kms. including heavy damages to the cross drainages works. On old Cuttack-Sambalpur road, there were also 2 breaches on Baratha-Kuanpal road at 5 km. There was breach on Chhatia-Salepur road at 17 km. At Bindhanima-Khandahata road there were several breaches between 4th to 12th kms. In Gopamathura-Bangurisingh road, there were one breach at 1st km, 2 breaches at 3rd kms. and a big breach at 5th km.

Other serious damages in Cuttack district are in Banki areas. The road structures and breaches around Banki areas include Cuttack-Gobindpur-Banki Road, Banki-Simor Road, Banki-Kacheri road and Banki-Baideswar road.

The roads in Kendrapara area were also seriously damaged. There was a breach round Kendrapara town between National Highway junction and Kendrapara dislocating traffic for about 7 days. The road from Kendrapara and Marsaghai was under submergence for a long period causing heavy damages. Similarly Cuttack-Chandabali road, Patamundei-Rajnagar road-Kendrapara Indupur Road, Kendrapara,-Basupur road, Kendrapara-Kolaghat road, Aul-Nuagaon-Dasipur road and many other village roads were under submergence to which severe damages have been caused.

Puri district

The following roads in Puri district were badly damaged and traffic dislocated.

Bhubaneswar-Puri—There are six numbers of breaches between Dhauli junction to Uttara. These breaches were repaired by doing day and night work and engaging about 700 labourers and was opened to traffic on 8-9-1982.

Saradeipur-Nimapada road—The approach to vented causeway was washed out Saradeipur I. B. to Daya embankment, in the 1st Km. (length 0·04 Km.).

Nimapada-Balanga road—Sunamuhi-Satapada road, Sakhigopal-Algum road, Jaypur-Saranjodi road, Banamalipur-Balanga road, Kakatpur-Konark road, Astrang-Nuagada road Pipili-Jatni road, Pipili-Delanga road, Patnaikia-Delanga-Khurda road.

The above roads were severely damaged causing breaches in number of places. Traffic in the above roads were restored by 6-9-1982 by engaging labourers at different points.

Ganjam district

In Ganjam district due to floods in Rushikulya river and her tributaries damages to the road surface have occurred in a number of roads. The notable ones in which breaches were caused and traffic were dislocated are as follows:

Balipadar-Balagutha, Rasulakund, Bhanjanagar-Talsingh, Tarasingh-Dasapala. Talising-Gallary road, Belaguntha-Gorada, Lembhi road, Kujagada-Gallery road. Khallikot-Boirani road, Rambha-Khandadoli road, Ganjam-Kusapalli road, Bhajiput-Kanchan road, Huma-Palluru-Prayagi road.

Chief Engineer (R. & B.)
Orissa, Bhubaneswar

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ORISSA FLOODS—
A Case for Disaster Management

Dr. Madhu Upadhyay

1982 has been the most unfortunate year for Orissa in living memory. There was a major cyclone in June, a severe drought in July and unprecedented floods in August and September. Normally one or two natural calamities visit the State every year and it seems each time the machinery to remedy the situation starts functioning almost from scratch. The question that strikes one is, can we build an infrastructure to meet such recurrent disasters and evolve a strategy for Disaster Management.

The most vulnerable parts of the State are the coastal districts of Puri, Cuttack and Balasore which are also among the most developed areas and constitute a part of the State's granary. Other generally affected areas are Bolangir, Phulbani, Koraput and Keonjhar.

The history of Orissa reveals that at one time the State was a maritime area and its merchants and sailors visited and traded with distant countries far beyond its coasts. Due to the flux of time and other historical reasons the same interest in maritime activities does not thrive now. An important strategy to meet the recurrent floods and cyclone situation would be to revive popular interest in the rivers and seas and encourage activities like swimming, rowing, boating, fishing etc.. particularly among the youth of the areas. An intimacy with seas and rivers should be developed by the young, so that at the times of disaster they can study the situation carefully and react to the moods of the rivers and seas suitably and effectively.

Youth organisations including Boy Scouts, National Cadet Corps, Girl Guides and Clubs should be actively encouraged and supported to take part in aquatic and maritime activities. The cost in this regard would not be very much, as a rowing boat costs less than Rs. 500 and could keep 500 young people gainfully active and entertained. This would also be a healthy pastime and recreation providing much needed training to meet the exigencies of floods and disasters. Those activities should be organised in affected and vulnerable areas and supervised by the Naval Wing of the N. C. C., which should enlarge and intensify its activities to cover citizens and youths particularly from coastal areas.

In two articles, Shri Chandrasekharan, Relief Commissioner has outlined the limitations in correctly forecasting the timings and intensity of floods and cyclone. While it may be true that a precise forecast in regard to the day, time and intensity of a disaster may be difficult to people in the vulnerable areas are experienced to expect it at certain parts of the year/month. But being the poorer State in India a majority of the people are unable to build up reserves and resources to meet the recurrent situation. They have to rely heavily on Government or institutional relief though what should actually be planned for them is release from periodic disasters.

It is suggested that the State should organise a corps of highly-skilled personnel who could go into immediate action, at lightening speed, in the event of a disaster. They should be equipped with a large fleet of flat-bottomed, speed boats and outboard motors, supported by village volunteers and youths trained in maritime and aquatic sports and activities as indicated earlier. They should also be provided with a working knowledge of first-aid and hygiene and be trained to receive relief in an organised and disciplined manner, so that no hardship or embarassment is caused to the relief giving agencies.

In building up an infrastructure for Disaster Management, priority is to be afforded to the strengthening of communication and transport facilities and linkages in vulnerable areas. A network of radio transmission and receiving centres, viable transport network backed up by all weather specially toughened roads, shelters at strategic places, stocks of durable food and essential medical and other supplies at vintage points during the "Disaster Seasons" will help in meeting the situation. The entire population of the area should be effectively organised, guided and supported by well-trained and motivated professionals and expert official and non-official agencies.

An organisation to protect the people, to the maximum extent possible, by timely evacuation will minimise the hardship and loss to lives. Similarly, cattle would also have to be protected and provided for, as these constitute important assets of the farmers and will help them to be rehabilitated after the disaster.

Warning signals and communications should be carefully analysed and guardedly published. There are two dangers here. Either the warnings may be ignored by the people or they may panic and over-react to them, which is even more harmful and dangerous. We must develop the skills/equipment to forecast as precisely as possible the areas and the extent of impact of the disaster and the effective action necessary to meet the situation. A major constraint in the implementation of this strategy is the poor transport network in the State. It has taken over two weeks after the floods to reconnect the principal city, Cuttack with the Capital—Bhubaneswar by road, a distance of about thirty K. Ms. In fact, if a road is breached, relief/succour are not available to the victims in an organised/adequate measure. Though maintenance of the roads is a decentralised subject the local bodies do not have/spend adequate resources for their maintenance. In Orissa where large areas are yet to be connected by Railways, it would be a good idea to suppelment the transport system with a major waterways network for transporting

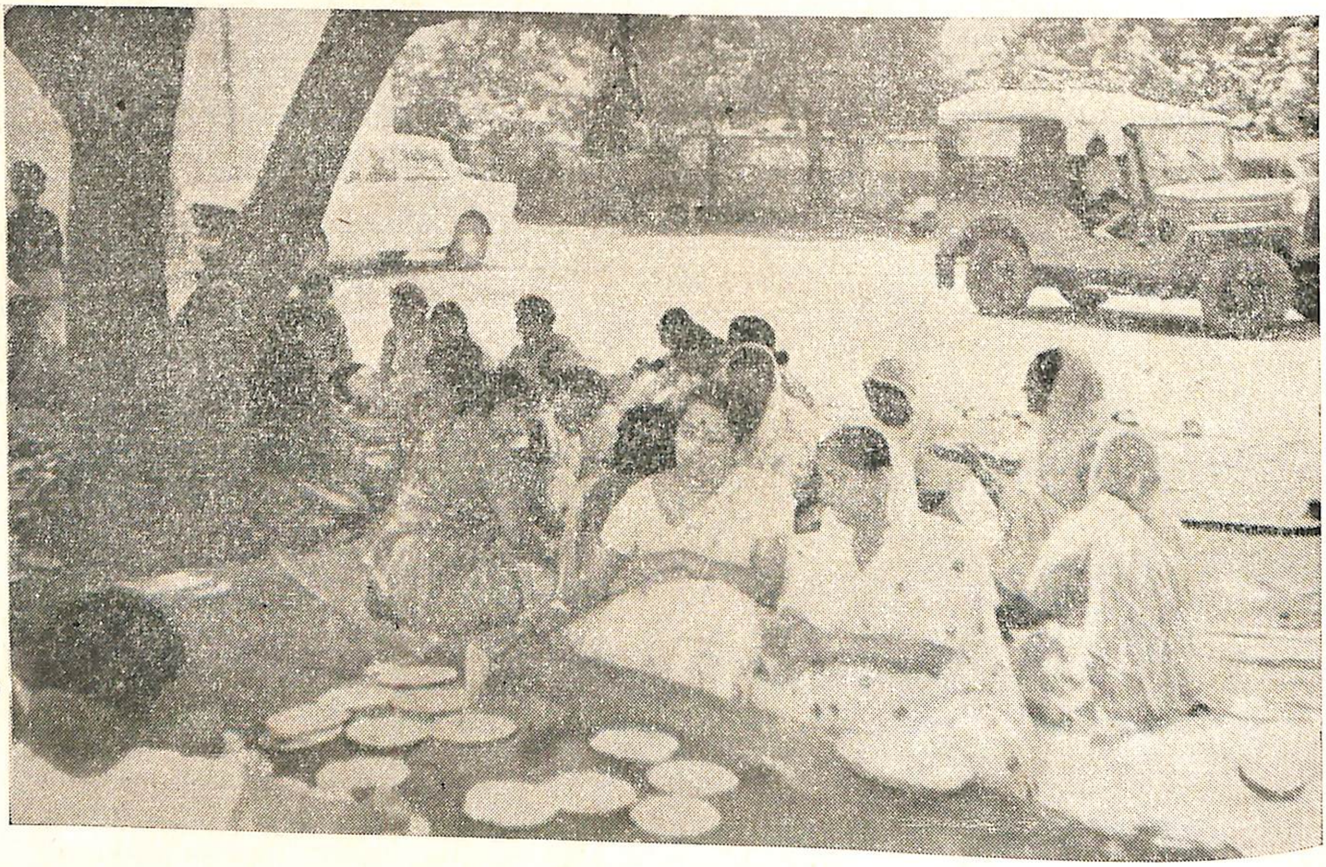

Photo : Santok Singh

Preparation of Chapaties by Ladies of Bhubaneswar at the Gurudwara Singh Sabha for Air dropping to Flood Victims.

men and material. This would also help in reviving the maritime tradition of the State and infusing a greater degree of awareness among the people, to meet the periodic disasters like foods and cyclones.

The latest floods are reported to have affected 5·2 million people in 8 out of 13 districts. Agriculture being the main stay of almost all the people, there is a need for intensive, time-bound research of flood/cyclone resistant crops as has been done in the case of drought prone areas and semi-arid tropics.

Touring the flood-affected Kendrapara and Kakatpur areas recently, I found that though damaged, some of the crops were standing even after being under water for several days. Hence, special strains of seeds and sapplings may be developed after extensive field trials to minimise the loss and provide for the early rehabilitation of the victims. Similar research/experimentation in construction materials in flood and cyclone prone areas and its subsidised supply will help in providing shelter and reducing regular doses of subsidy, which is not a long-term solution to the recurrent problem, at all.

Japan, another disaster prone country has effectively demonstrated how natural disasters can be negotiated with determination and imagination and may provide valuable insights and experience for our State.

Another important long-term-strategy must be to launch a massive programme of afforestation, which alone in the long run can prevent recurrent floods and help storage and conservation. The recent experience has revealed that dams and bridges breach or have to be breached and hence there have to be other more effective conservation strategies like a large scale programme of forestry as a long range solution to the problem.

The recent floods have also exposed our weakness and lack of expertise in several areas in tackling the situation effectively. For instance, a basic matter like preparation of food packets for air-dropping; the first lot contained cooked potatoes and chapaties, both of which spoiled in a day. Again being heavy the plastic bags used for packing brust open when they fell on the ground and spilled the contents. It was later that the message went around for dry food and light packets, by which time even those who

Photo : Santok Singh

Relief operations by volunteers of the Gurudwara Singh Sabha in Astarang area received the packets would not have felt too happy because of the spoilt food. When the food was dropped or taken to the affected areas by relief workers, there was a made and sometimes violent rush for it and very young and old people did not receive their due share. Again here some well-trained volunteers could ensure that there is order in the distribution of food and everyone got his due share.

During the visit to Kendrapara (Cuttack District) and Astaranga (Puri District) areas recently I found that though food was accepted by most of the people, they were packing it and taking it with them. It was revealed on enquiry that they already had two meals during the day and were not hungry. This implies that relief was reaching accessible areas in large quantities while others in difficult areas, lacking roads seem to be denied it. A co-ordinating body could ensure that relief actually went to the most deserving areas on a priority basis and prevent its overflow to accessible/influential areas. When food was being served it was found that some of the villagers did not line up for it. On enquiry they answered that they felt 'shy' to ask for food and to sit in a group with the poorer sections. There were people with status and felt reticent to receive relief, even though hungry. Voluntary agencies may take note of such sensitive victims and ensure that they are not denied relief, because they do not ask for it.

During the tour I found some of the very poor scrounging for insects, in waist-deep water for eating while others repeatedly cast their fishing nets with no rewards. In one case, a poor family offered their boy of ten as he could not be provided for. Many flood victims had put up tents on the road side and were the most frequent recipients of relief. One wondered how many more were marooned in areas which were not traceable/accessible and were possibly wiped out as a result of the floods.

Daleighai in the Jagatsinghpur area was breached at the end of August, when the floods first came in. But this breach was not repaired. Hence, a further rise in the water level of the Kathajori river has caused a second flood in the area and prolonged the distress and sufferings of the affected people.

Many voluntary agencies have responded admirably to the appeal for food packets. Foremost among these is the Gurudwara Singh Sabha of Bhubaneswar with its dedicated and energetic President, Sardar Santol Singh. About 10,000 Chapaties and 300 Kgs. of cooked " Khichri " were being supplied to the flood victims. In addition, clothes, salts, matches, candles and Medicines were also being supplied. A number of ladies clubs of Bhubaneswar have participated in this laudable effort and wives of senior officers, businessmen and ladies from well-to-do families were engaged in making and serving the food.

Important relief measures, particularly in the area of Public Health would be required in a big way to meet the post-flood problems. The water-supply has become highly contaminated, with dead bodies and other polutants. Cholera, typhoid and infectious diseases threaten to become major killers. Since there is no other source of water-supply, efforts should be made to supply potable drinking water, while providing for large scale inoculation and treatment.

The Official machinery has swung into action and Central Government help is also being received. But this is not the end of the problem of floods and cyclones and their crippling effect on the slender economic resources of the State. What is called for is a perspective plan for Disaster Management on a war footing an area in which the Administrative Staff, College of India at Hyderabad has been working. One hopes that the experience already gained in meeting flood situations and the expertise available in India and countries like Japan would be made good use of in a planned and organised manner, to minimise human misery and suffering.

150, Sahidnagar, Bhubaneswar

Acknowledgement :
Brigadier Joginder Singh
Sardar Tarlok Singh
Mr. & Mrs. Chandrasekharan

Restoration of Lift Irrigation Projects affected by Flood and Cyclone

Shri S. N. Pradhan

Due to a cyclonic storm which occurred in the first week of June, 1982 a large number of Lift Irrigation Projects installed in the district of Balasore, Cuttack, Dhenkanal, Keonjhar, Mayurbhanj and Puri were damaged. The storm water which inundated the project area caused immense damage to the distribution system and submerged the pumps which were in operation at the site. The roof of the pump house, store and office buildings were blown away and at places the buildings collapsed under the heavy wind pressure. The cost involved for restoration of these works was estimated at Rs. 1,90·00 lakhs. A district-wise break-up of projects affected and expenditure involved for their restoration is given in Table I below:—

TABLE—I

Sl. No.	Name of the district		No. of projects affected by cyclone	No. of store and office buildings damaged by cyclone	Estimated cost involved in the restoration of projects in Rs. lakhs
(1)	(2)		(3)	(4)	(5)
1	Balasore	..	189	8	18·83
2	Cuttack	..	1,164	129	136·53
3	Dhenkanal	..	163	38	21·37
4	Keonjhar	..	39	15	4·00
5	Mayurbhanj	..	20	..	2·94
6	Puri	..	56	9	6·33
	Total	..	1,631	199	190·00

Soon after the cyclone a dry spell occurred in the State affecting almost all the districts. The restoration work had to be taken up on war footing. Though the repair of distribution system could not be completed due to short period the pumps had to be repaired and replaced to effect water-supply to the areas affected by dry spell. Excepting 299 Lift Irrigation Projects all the projects were kept ready in the cyclone affected area to effect water-supply to the people. Similar preparations were also made in other districts which were affected by drought and water-supply was made available to the people. In total 3,120 number of L. I. Projects have been put into operation to effect water-supply to the areas where dry spell occurred.

While the projects were in operation a sudden and unprecedented flood occurred in river Mahanadi and its branches. High flood was also there in river Rushikulya flowing through the district of Ganjam. Due ro submergence of land and several breaches in the protected embankments a lot of damages have occurred to the River Lift Projects installed along both the banks. The distribution systems of tube-wells in deltaic area have been washed away by the flood water. Pumps which were in operation could not be shifted in a short notice as a result of which most of them got submerged in the flood water. The pump houses and delivery tanks installed on the bank of the river had collapsed in many situations. The R. C. C. pipes laid as a part of the distribution system and open field channels have been washed away due to high velocity of water flowing over them. In some areas structures have been badly covered with silt and sand. In some situation the river course has changed and the revival of the river lift projects necessitate installation of intake wells. Construction materials such as Cement has become clodded in many of the stores which got submerged under flood water. A jeep was carried away by the flood and buried under sand at Banki. Some diesel Pumps have been also submerged under water and these require reconditioning and servicing. In total 1,677 number of L. I. Projects and 98 number of stores, office buildings etc. had been affected by the flood in different districts. The restoration of these projects to pre-flood condition involves an estimated expenditure of Rs. 440·94 lakhs. A detailed districtwise break-up of projects and stores got affected by the flood and their estimated restoration cost is furnished in Table-II enclosed.

The Orissa Lift Irrigation Corporation has no resources of its own. The maintenance cost of public sector L. I. Projects are subsidised by the Government. Since the provision for maintenance and operation of the projects under current year budget is hardly adequate to meet the normal operational cost, unless the additional expenditure is sanctioned early by the Government as a grant towards special repair and restoration of the projects it will not be possible to operate the project to effect water-supply in the coming rabi season. Blockwise list of projects affected and their estimated cost is furnished in Annexure-I.

TABLE—II

District-wise break-up of L. I. Projects, stores other buildings etc., damaged by flood of August-September 1982 and estimated cost involved for repair and restoration

Sl. No.	Name of the district	Nos. of L. I. Ps. affected in the flood	Nos. of stores/buildings affected	Amount required for repair and restoration of project and stores/buildings	Amount required for repair and replacement of T. P. and ofher materials	Total amount required for repair & restoration
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Cuttack ..	1,103	91	277·98	18·11	296·07
2	Bolangir ..	65	..	18·00	..	18·00
3	Dhenkanal ..	18	..	6·49	..	6·49
4	Ganjam ..	199	..	15·75	..	15·75

Sl. No.	Name of the district	Nos. of L.I.Ps. affected in the flood	Nos. of stores/buildings affected	Amount required for repair and restoration of project and stores/buildings	Amount required for repair and replacement of T. P. and other materials	Total amount required for repair & restoration
(1)	(2)	(3)	(4)	(5)	(6)	(7)
5	Kalahandi ..	7	..	0·68	..	0·68
6	Phulbani ..	73	..	28·06	..	28·06
7	Puri ..	116	6	38·10	2·00	40·10
8	Sambalpur ..	96	1	33·13	2·64	35·77
	Total ..	1,677	98	418·19	22·75	440·94

Managing Director
Orissa Lift Irrigation Corporation
Bhubaneswar.

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RELIEF BY VOLUNTARY ORGANISATIONS OF BHUBANESWAR

Voluntary Organisations of Bhubaneswar like the Gurudwar Singh Sabha and Bhagaban Shri Satya Sai Seva Organisations have come forward to render relief to the flood stricken people of Orissa.

At the instance of the State Government the Gurudwar Singh Sabha, Bhubaneswar have started preparing cooked food packets from August 31, 1982 and sending the same to the Air-port for air-dropping in the flood-hit areas. Each packet contains 3 chapatis and cooked potatoes. They have so far supplied 11,220 packets of chapatis with cooked potatoes besides cooked rice mixed with chana dal and boiled potatoes in packets. Thirty-three quintals of atta, 16 quintals of rice, 13 quintals of potatoes and 2 quintals of dal have been utilised till September, 4 for preparation of food for relief.

The Sikh Community of Bhubaneswar have collected Rs. 10,000 approximately for relief work. The Ladies Club of Bhubaneswar have rendered all help to the Gurudwar Committee in preparing food packets.

Bhagaban Shri Satya Sai Seva Organisation of Bhubaneswar has also been actively participating in the relief effort. For the last four days they have been preparing about 1,400 food packets weighing about 5 quintals, every day. Each packet contains 5 pieces of roti, some cooked/fried potato, onion, chilli, salt and gur. They are sending the food packets for air-dropping in flood affected areas. Seven Bhajan Centres of the organisation were engaged in preparing food packets.

DAMAGES AT A GLANCE

Districts affected	..	8
C. D. Blocks affected	..	114
Municipalities affected	..	7
N. A. Cs. affected	..	16
Total population affected	..	54 lakhs
Human casualty	..	127
Cattle and small animals lost	..	26,359
Principal crops damaged		Paddy, Pulses, Jute, Oil-seeds Vegetables.
Cropped area affected	..	12 lakhs hectares
Sand cast area	..	75,000 hectares
Houses swept away	..	26,500
Houses fully collapsed	..	1,58,322
Houses partially collapsed	..	3,25,227

FLOOD DAMAGE TO NATIONAL HIGHWAY No. 5

Between Cuttack and Bhubaneswar

Shri B. M. Das

There was unprecedented flood in the rivers Mahanadi, Kathajodi and Kuakhai between 30th August and 2nd September 1982. The floods, apart from destroying life and property, caused untold misery to the people and left permanent scars everywhere.

The portion of National Highway between Cuttack and Bhubaneswar is one of the busiest roads not only in the State but of the country as well. Unfortunately traffic on this road between Cuttack and Bhubaneswar, was totally cut-off, due to this unprecedented flood, for a period of 15 days which even affected the life style of the people of the two cities. Thousands of long distance trucks and other vehicles were stranded right from Berhampur to Bhubaneswar and again between Cuttack and Baripada.

In the floods of August / September 1982, several stretches of this road were over-topped by flood water at many points resulting in severe damage to road structure as well as berms/flanks. Besides a stretch of nearly 1·0 Km. near Rasulgarh was under Knee-deep water for 4 days. But the most serious damage occurred between Bhanapur and Balikuda, i. e., between 16·0 Km. to 18·0 Km. In this reach, there were three major breaches on this road, totalling to a length of 13·00 ft. with depth of scour holes varying between 4 ft. to 16 ft.

Such breaches were not apprehended earlier as the road as well as the nearby villages. are protected by the flood embankment on the left bank of Kuakhai river. But on the 31st August 1982 the flood embankment gave way which ultimately resulted in three breaches on National Highway No. 5 between Bhanapur and Balikuda. Thus there was total dislocation of road traffic between Cuttack and Bhubaneswar. The only means of transport was by Train. Even rail traffic was stopped for 2 days. But the damage to Railway was less severe as the railway line is located on higher ground.

The breached portion of road could only be approached and inspected thoroughly on the morning of 4th September 1982 after the flood level subsided. It was decided to restore surface traffic as quickly as possible and work was commenced from the same day. i. e., 4th September 1982 evening

By this time, thousands of vehicles had been stranded on both sides. Therefore to allow normal movement of traffic within shortest possible time, it was decided to construct diversion roads pending works in the breaches.

As such the roads had to be constructed through areas stagnating under 4 ft. to 16 ft. of flood water. Once this plan was finalised work was started in full swing. The diversion alignments were demarcated and timber poles were driven to protect the sides of the proposed road. These were Inke with bamboo jaffree. providing a sort of jaffree wall, against which sand bags were placed to retain the materials required for filling the central portions. The alignment was then filled up hy dumping boulders up to the water level then existing and over the boulders, sand and moorum bags were laid for providing an even surface. Finally soling and metalling wera done on the road surface. This specification was followed so as to enable the road to withstand heavy National Highway traffic. Depending on the depth of water, sand and moorum were also dumped in the breaches in place of boulder filling.

Apart from difficulties in executing work in standing water (with depth varying from 4 ft. to 16 ft.), the diversion road work was frequently disrupted due to rains after flood. The working space was limited and the access to work site for trucks carrying construction materials was difficult, Besides, there was constant trouble from the labourers most of whom came from the flood affected villages. However, engaging such labourers departmentally, also provided substantial relief to the people of the flood affected villages nearby.

The three diversion roads were completed on 14-9-1982 night. Excluding 2 days when no work could be dcne due to heavy rains, the three diversion roads were constructed in just 8 working days. At the initial stage these diversions have been constructed for single lane tratfic till they get stabilised for taking further traffic when their widening will be considered. Traffic was allowed from 2400 hours of 14-9-1982. All the stranded trucks passed over the diversion roads by morning of 16-9-1982. It may be mentioned that nearly 7,000 trucks crossed over within 30 hours after opening of diversion roads, in addition to other normal traffic.

The lengths of diversion roads from Bhubaneswar side are 200 mtrs, 157 mtrs. and 165 mtrs. respectively. The work was done jointly by both Cuttack and Bhubaneswar National Highway Divisions due to extreme urgency, working from both ends.

Huge quantities of boulders, moorum and sand were utilised in constructing the diversion roads. All the available Departmental machinery such as Dozers, Roliers Generators, trucks and Pumps etc. were pressed into use.

After restoration of traffic, the diversion roads are being constantly repaired and maintained. Such maintenance work will continue till the breaches in the main road are closed and traffic is allowed on the main road. The whole area has been provided with street lights for safety of vehicles and pedestrians and movement of traffic in the single lane is being controlled by the Police.

At present, single lane traffic has been allowed on the diversion roads. There is now a proposal to provide double-lane traffic by widening the diversion roads, which has already been started. In the meantime, steps are being taken to accelerate the work on the main road in consultation with officers of Government of India,

In any case, the people, particularly the commuters between Cuttack and Bhuhaneswar are not likely to forget the havoc caused by flood resulting in virtual closure of Cuttack-Bhubaneswar road.

In achieving this herculean task of restoring the normal traffic on National Highway within a period of 10 days, help and co-operation from all concerned deparments were available. During the working period, frequent visit of the work site by the Minister (S), Works, Housing, Urban Development and Geology and the Engineer-in-Chief-*Cum*-Secretary to Government of Orissa, Works Department and their guidance inspired confidence in the persons associated with this work, and led them for early completion of the same.

Chief Engineer, National Highway,
Bhubaneswar.

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The women of Bhubaneswar at work

Shri Amar Singh

The recent floods of unprecedent magnitude, worst in living memory devasted an area of 90,000 sq. Kms. in 8 districts affecting three million hecters of agricultural land remaining immersed. They wiped out villages after villages and sweeping away about 16,000 animals, killed 400 persons and left behind thousand upon thousand of men and women without their hearth and homes. They were marooned. Most of them could not be reached for several days. This sad plight which engulfed them moved all communities in such a manner that without the distinction of caste, colour and creed, men and women joined hands to send out relief to the helpless mass all over the area. Helicopters went into action to drop food packets.

The Women of the Sikh Community at Bhubaneswar at work in Cooking Rories etc. in their kitchen arranged in the Gurudwara Singh Sabha, at Janpath Road.

Different organisations, army jawans, missionaries, country boats, rescue boats were pressed into service to send them food. A number of kitchens began to function, Private sources and Relief authorities arranged the supply of Wheat, Rice, Dal, etc,

Our women rose to the occasion and took a great part relieving the immediate distress that was caused by biting hunger.

The Sikh Community rendered yeoman's service in offering help in different ways. This great calamity which struck Orissa has no parallel brought about a unit and a sense ef urgency to all. The rich and the poor began to work round the clock in helping the Government in whatever way they were called upon to display their talent It was an operation over a war footing.

Our women did not lag behind in their zeal and physical capacity. At Bhubaneswar Mrs. A. K. Roy, President of the Ladies Club and Mrs. Chandrasekharan, wife of the Special Relief Commissioner, gave a call and arranged a kitchen (see photo) at the Gurudwara Singh Sabha situated on Janpath Road in Kharvela Nagar. Wives of the officers and women of the Sikhs came forward in hundreds volunteering to function with an enthusiasm that was unique. They worked from 6 a. m. to 2 p. m. continuously every day for a fortnight coaking food and preparing food packets that were sent out in time to the marooned mass through Helicopters. This kitchen sent out 27,720 packets containing 33,160 Roties with patato fry/onion and green chillies.

The total Ata that was converted into Roties by those selfless women volunteers weighed 4,200 Kgs. The rice and dal that were cooked weighed 4,000 Kgs. It was an excellant job and those women will be remembered long for thair social services that was rendered by their motherly instinct.

GOVERNOR VISITS BANKI

Shri C. M. Poonacha, Governor of Orissa on October 4 visited Banki, one of the worst flood affected areas of Cuttack district and distributed cooked food, biscuits and liquid milk to 2,000 children.

Both the State Red Cross and the State Council for Child Welfare of which the Governor is the President, have intensified their relief programmes in flood affected areas by opening Feeding Centres and Day Care Centres for children. Local Students, volunteers, Red Cross Members and trainees of Bal Sevika Training Centres have been drafted to organise the relief programmes.

The Governor visited the Red Cross Feeding Centres at Sisua in Banki Town and the Day Care Centre in Girls' High School premises where 2,000 children of 0—6 age group are being provided with cooked food and milk every day. The Red Cross has already been running the Centre at Sisua for the last 15 days and it will continue for one month more. The Child Welfare Day Care Centre opened since September 21 will also continue for a month for the present. A Lady Doctor posted by the State Council for Child Welfare conducts regular health check-up of children attending the Day Care Centres. Dr. Kamini Mishra mentioned to the Governor that skin-diseases and dysentery are prevalent in greater measure among the children coming to the Centre.

In course of the visit, the Governor saw the 400 metre breach in Mahanadi which caused disaster to Banki Town. He discussed with the officials about the relief measures emphasised the reconstruction of houses on permanent basis through an unified agency.

OSEB incurs heavy loss

Shri Amiya Kumar Mukherjie

Due to unprecedented heavy rainfal in the western parts of the State, there was severe flood in the Mahanadi Basin of the Balangir, Phulbani, Sambalpur and Dhenkanal districts. This also resulted in the worst flood in the Delta area of Cuttack and Puri districts. There was also flood in the Ganjam district which caused damage to the electrical installations of the Board in the Bhanjanagar area.

Extent of damages

The system of the OSEB which was largely affected were the 33/11 KV, and LT. line, 33/11 KV 33/0·4 KV and 11/0·4 KV Substations. However, due to the floods in river Ong. the river-crossing towers of the 132KV line, the 66 KV, and the 33 KV line between Bargah and Balangir were completely damaged.

Hazipur near Dalaighai

Two districts, namely Balangir and Kalahandi were without any electricity and plunged in darkness due to failure of the Ong river-crossing towers. Besides, vast areas of Cuttack, Puri, Phulbani and some areas of Sambalpur and Ganjam district were without electricity, the distribution system having been badly affected. The districtwise details of the installations of the Board which were affected by the floods is given in Annexure I.

Nature of damage

There were a large number of breaches in river and canal embankments and roads due to which the transmission and distribution system of the OSEB were submerged under water to a very large extent and for many days. In many places the transformers were also submerged in water. In some areas, there was sand-casting on the supports and even on the conductors of the overhead lines. In many areas in the Boudh-Kantamal area, as also in Kathajori-Mahanadi basin, H.T. and L.T. lines running along the river and supplying power mostly to the Lift Irrigation Projects, have been totallywashed out.

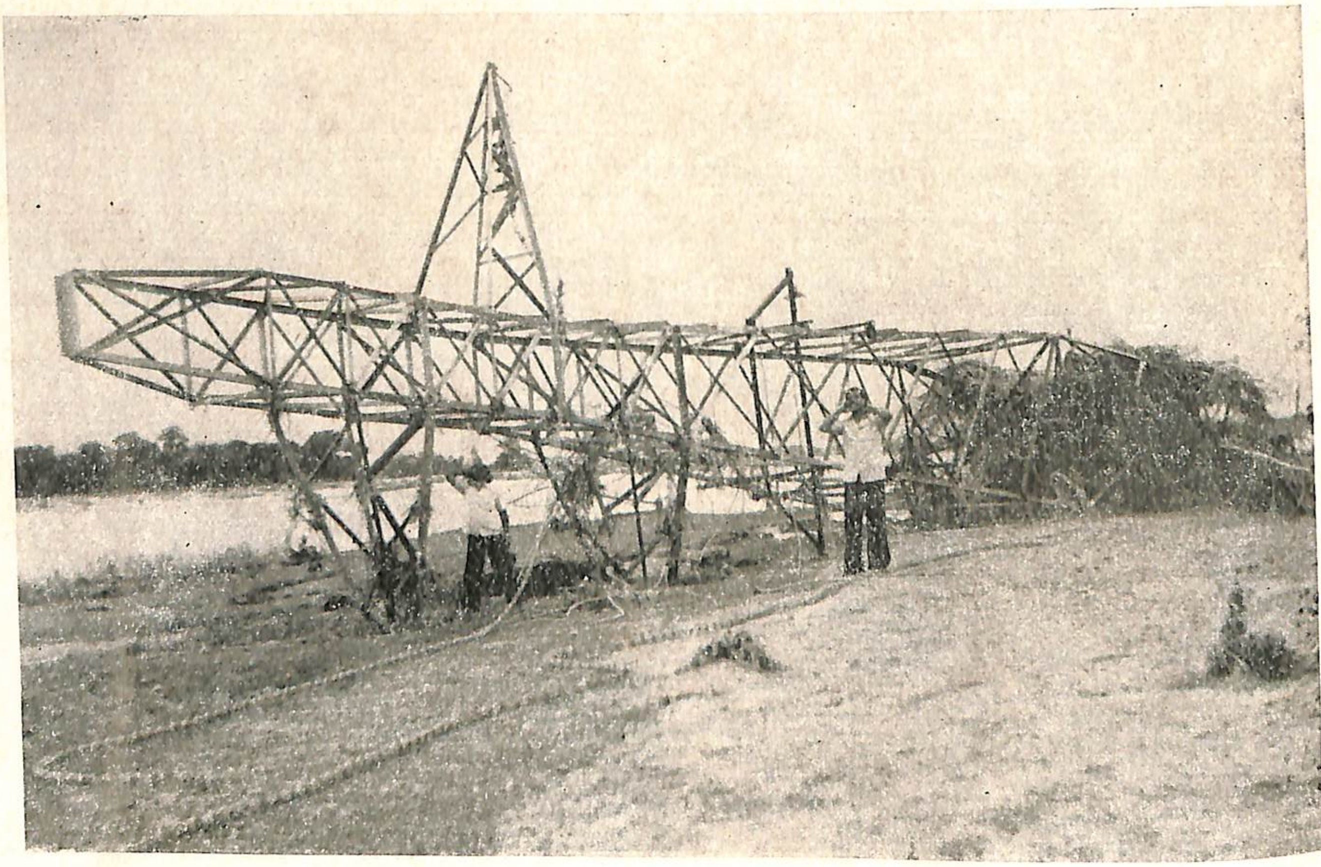
The conductors of the overhead lines were also used by some of the villagers as guide-ropes to cross the swirding flood waters. Such use of conductors have also resulted in quite a substantial damage calling for replacement of conductors.

The 132KV/33KV S/S at Kendrapara supplying power to an wide area had to be switched off as the flood waters entered into the Switchyard. Similarly, the 25VA 33/11KV S/S at Chauliaganj supplying power to the Cuttack city had to be switched off as the flood waters entered the Switchyard and caused damage to the 11KV control panels, current transformers and the power and control cables.

Restoration of power supply

As has already been mentioned, there was wide spread disruption of power supply.

In the rural areas, where the level of the flood water had risen very high, the majority of the 11KV feeders were switched off to avoid the hazards of electrocution (This timely action has reduced—rather eliminated



33_KV, River-crossing Tower on river "Ong" Balangir district the casualties to human beings and animals).

Many of the areas became inaccessible for days together due to flood waters. Even though, this caused delay in reaching many areas, prompt action was taken to restore power supply to a vast area, as soon as the flood water receded to a reasonable level. Within 4 to 5 days of the flood, power supply was restored practically all the cities and towns except in Balangir and Kalahandi districts and Boudh area of Phulbani district. Restricted power supply to essential loads was also restored in Bhawanipatna and Balangir, etc. in these two districts by the 4th September 1982. Pending erection of the new 132 KV. towers, alternative power supply to the extent of 3 MVA. at 33 KV. has later been made available to these districts and also to Boudh area of Phulbani district. It is expected that the 132 KV. line from Bargarh would be energised in the last week of September 1982.

By the 15th September 1982, power supply has been restored to all block headquarters of Cuttack and Puri districts.

Cost of repairs

The Field Engineers of the O. S. E. B. took-up restoration of power supply immediately, pending enumeration of the damages. The total expenditure would be of the order of Rs. 366 lakhs, with no provision towards the overhead charges.

Presently, due to the unfavourable ground conditions and the necessity of quickly resuming power supply, repair works of the permanent nature cannot be attempted. Therefore, the final restoration/repair works will have to be taken-up a little later.

The cyclone in the June 1982 which damaged extensively the assets of the O. S. E. B., had a very adverse effect on the finances of the O. S. E. B. as it came during the period of low revenue on account of power-cuts, necessitated by the low condition in the Hirakud and Balimela Reservoirs. Even before the power supply position could be restored to normalcy, by lifting power-cuts, the O. S. E. B. has been shouldered with the additional burden of restoring the damages on account of heavy flood. Therefore, unless the estimated amount towards restoration of normal supply is made available immediately, O. S. E. B. would experience considerable difficulty and normal developmental work will be adversely affected.

DAMAGE TO ELECTRICAL INSTALLATIONS

I. Distribution System—

(1) 33 KV. Line	..	22 Kms.
(2) 11KV. Line	..	185 Kms.
(3) L. T. Line (2 Ph. and1Ph.)		247 Kms.
(4) 33/11 KV. S/S (1600 and 630 KVA).		5 Nos.
(5) 11/0.4KV. S/S	..	395 Nos.
(6) Service connection—		
(i) Single phase	..	15540
(ii) Three phase	..	1910
(7) Street Light Fittings.	..	800 Nos

II. E. H. T. System and Major 33/11KV S/S—

(1) 132 KV S/C Line	..	19 Km.
(2) 66 KV S/C Line	..	6Km.
(3) Major 33/11 KV S/E	..	1 No.

Annexure-I

DETAILS OF ELECTRICAL INSTALLATION AFFECTED

Name of district	Name of division	Lines affected in Km.			Sub-station affected		Service connection damaged		Street light damaged	Civil works damaged	Others
		33 KV.	11 KV.	L. T.	33/11KV.	11/4 KV.	1	3			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Balangir ..	E. C. D., Balangir	45	185	137	1	8 33/4 KV.	130	81	20	One repair shed	
	B. E. D., Balangir	14	113	287	Nil	67	1255	665	220	E. S. O. Office at Balangir & Sonepur.	
	S. E. D., Sambalpur	Nil	5	3	Nil	Nil	50	32	20		
	Total ..	49	303	427	1	67+ 8(33/4 KV.)	1435	778	260		
Cuttack ..	B. L. D., Bhubaneswar.	56	210	295	2	26	750	225	100	Lineman shed —5 Nos. Transformer plinth—20 Nos.	
	E. C. D., Jagatsingpur.	42	530	615	2	210	5000	300	100		
	K. E. D.. Kendrapara.	10	58	118	..	69	1600	80	..		
	E. C. D., Marshaghai.	40	200	225	1	105	1000	80	25		
	C. E. D., Cuttack ..	25	60	50	..	55	500	60	60		

	K. E. D., Khurda ..	64	23	70	1	15	62	49	150	
	E. C. D., Khurda ..	1	72	32	1	12	94	52	..	
	Total ..	238	1,153	1,405	7	492	10,420	866	435	
Dhenkanal ..	E. C. D., Angul ..	22	26	19	..	8	150	45	15	
Phulbani ..	P. E. D., Phulbani	79	326	192	6	186	900	104	102	Fuse Call Centre—12 Nos.
Ganjam ..	B. E. D., Bhanjanagar.	1	10	10	..	..	..	..	..	
Puri ..	B. D. D., Bhubaneswar.	10	10	25	Nil	11	40	10	..	10 Nos. transformer plinth.
	P. E. D., Puri ..	4	65	65	3	11	1,315	60	5	Lineman shed at— (*a*) Delang (*b*) Uttara (*c*) Kakatpur
	K. E. D., Khurda ..	5	11	20	1	9	..	..	..	Lineman shed
	E. C. D., Khurda ..	..	115	72	..	29	2,220	57	20	
	Total ..	19	201	182	4	60	2,575	127	25	
Sambalpur ..	B. E. D., Bargarh..	2	32	20	Nil	12	80	9	3	
	Total ..	2	32	20	Nil.	12	80	9	3	
	Grand Total ..	410	2,051	2,255	18	825 +8 Nos. (33/0·4 S/S.)	15,560	1,929	840	

Chief Engineer, R. E. (O. S. E. B.)

From the Editor

The August 82 floods in Orissa were the worst in history.

Orissa is a creation of floods, and probably to compensate large scale devastations periodically occur. But the total devastations of August 82 floods was unprecedented.

Unimaginable heavy rains on 29 and 30 August 82 in the lower reaches of Mahanadi river caused the torrential run-off which swelled the frail streamlets, streams, tertiary and secondary rivers and landslides in the hills and mountains. The slow and steady deforestation indulged by human beings in their search for livelihood and the gradual rise in the river-beds over the last decades were the main contributory factors to this flood.

The floods affected 90,000 square miles covering five millions of people in 9,000 villages of 114 blocks in eight of thirteen districts of Orissa. There were 500 breaches of embankments. One-fifth of cultivated lands of Orissa were inundated. The loss of Government property alone is estimated at 616 crores and the total loss may run to thousands of crores.

Our beloved Prime Minister Smt. Indira Gandhi visited Orissa at this hour of sorrow and has promised adequate Central help. Shri J. B. Patnaik, Chief Minister personally initiated, organised the relief operations even before the floods had reached the peak. The fact remains that probably due to his untiring effort and far sight the relief and restoration works were moving object oriented. That the death toll was about 100 in this devastating flood itself is a pointer to the adequate warning given to the people.

Only in calamity and not in prosperity is the matter of the people and Government tested. The calamity which visited Orissa has proved to the hilt that the Government under the leadership of Shri J. B. Patnaik has been adequate to meet the situation.

Orissa Review brings out this issue to highlight the 82 August floods and we hope this will be a source of reference to the future planners of relief, rescue and restoration.

Satyananda Champatiray

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